



CHEETAL

JOURNAL OF

The Wild Life Preservation Society of India

SPECIAL HIMALAYAN WILD LIFE ISSUE

Vol. II

NOVEMBER, 1968

No. I

Two bhural ewes above Har-ki-Doon.

—Photo: Hari Dang.



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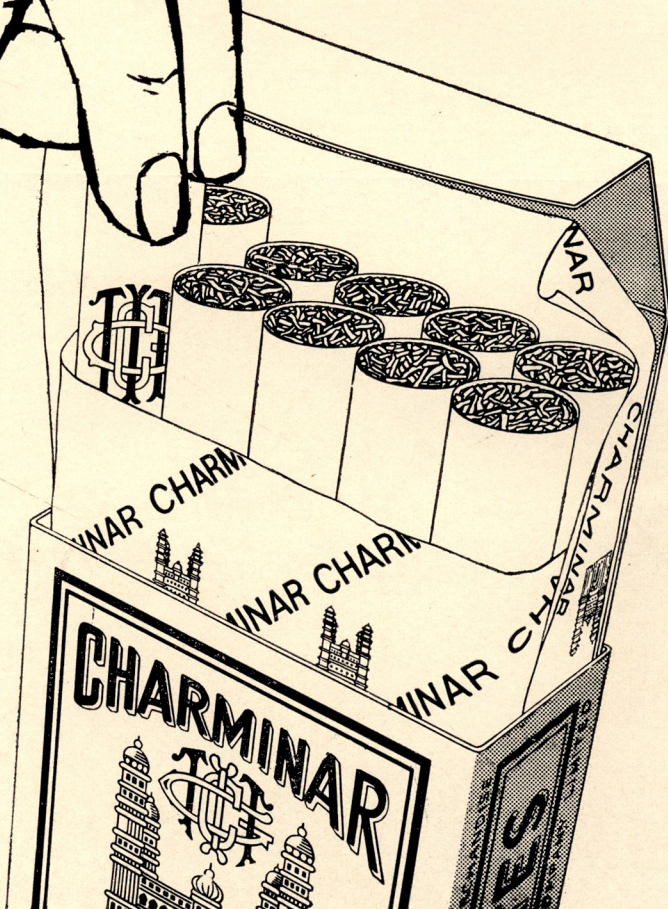


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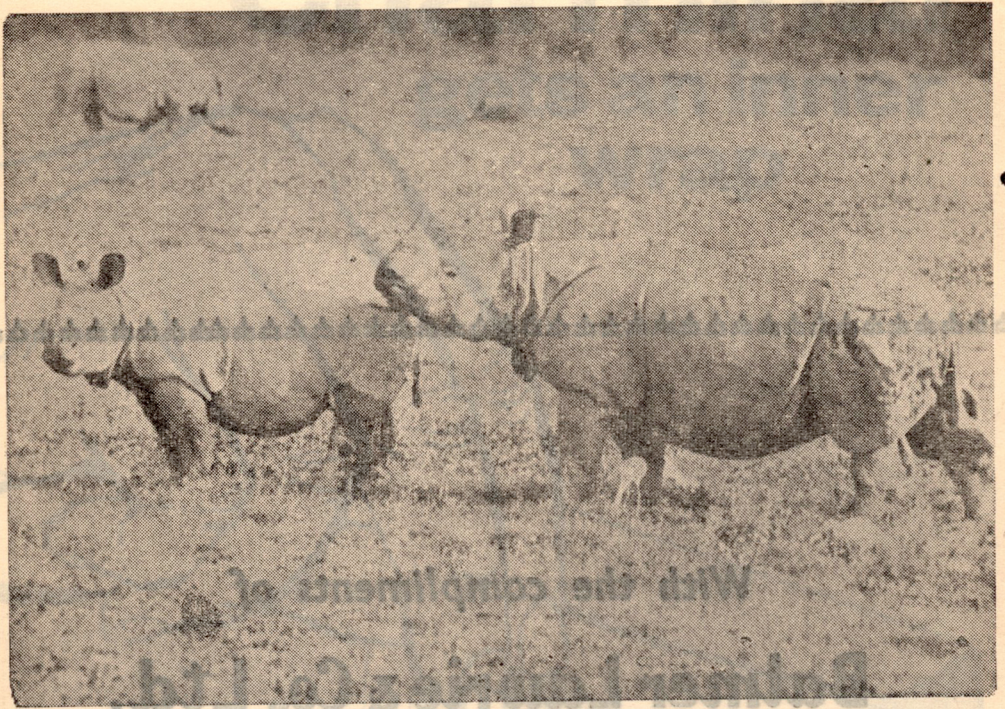


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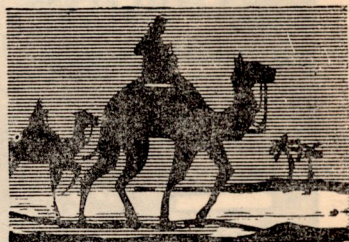
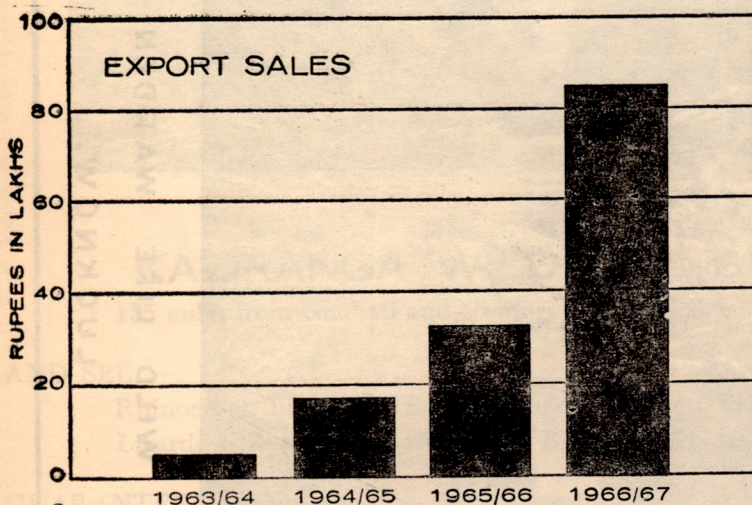


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Wild Life Preservation Society of India

1. The aims and objects of the Society are as follows:

- (a) To promote interest in and impart knowledge regarding the preservation and conservation of all forms of wild life, particularly among the youth of the country.
- (b) To co-operate with the Govts. of India and States and with other Societies and Institutions having similar aims and objects in working for the interests of wild life.
- (c) To assist in enforcing and actively supporting the Forest Acts, Wild Birds and Animals Protection Acts and Rules etc. of States and the Indian Arms Act and Rules in so far as they pertain to wild life and to bring to the notice of the authorities any infringement of the same and to assist in the detection and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wild life administrators in the formation, maintenance and protection of Sanctuaries and National Parks, the preservation of wild life in general and rare species of India in particular and in the introduction of exotic species into the country, the rehabilitation of rare species etc. and in the revision on rational lines of the shooting and fishing rules, so as to conserve and increase wild life stocks.
- (e) To raise funds for the carrying out of the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wild life.
- (f) To promote sportsmanship in shikar and to recognise well regulated shooting and fishing, as a means of preserving wild life and fish so that through wise use the surplus may provide a recreational asset to the nation.
- (g) To carry out publicity and propaganda for the preservation of wild life in India by means of monographs, journals, films, film strips and other feasible methods.
- (h) To assist members of the Society in obtaining shooting and fishing facilities and facilities for viewing and photographing wild life in India.
- (i) To conduct research into the problem of Wild Life management in India, and in pursuance of this, to initiate, encourage and, where possible, assist in projects for the study of threatened species and related subjects and to provide reference and research facilities for such work.
- (j) To carry on such other activities which will serve the above subjects.

What membership of Wild Life Preservation Society of India will entitle you to ?

1. You will become an active member of the growing number of Wild Life enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of Wild Life for posterity.
2. You will be entitled to the full use of the Library of the Wild Life Preservation Society and of its reading room.
3. You will receive a membership certificate.
4. You will receive a personal Identification and Membership card.
5. You will be entitled to buy all publications of the Society at a concession rate.
6. You will be entitled to buy at concession rates the Society's Greeting Cards, Calendars, Tie, Lapel badge and the Balance of Nature Game (specially Published in colour for its educative and recreational value).
7. You will be supplied "Cheetal", the half yearly journal of the Society free.

The I.U.C.N., Morges (Switzerland)

What is IUCN ?

The International Union for Conservation of Nature and Natural Resources (IUCN) is an independent international body whose membership comprises states, irrespective of their political and social systems, government departments and private institutions as well as international organisations.

IUCN represents those who are concerned at man's modification of the natural environment through the rapid spread of urban and industrial development and the excessive exploitation of the earth's natural resources, upon which rest the very foundations of his survival.

IUCN's objective

IUCN's main purpose is to promote or support action that will ensure the perpetuation of wild nature and natural resources in as many parts of the world as possible, not only for their intrinsic cultural or scientific values but also for the long-term economic and social welfare of mankind.

To further the objective the Union promotes:

AWARENESS through education, so that as many people as possible may understand the value and importance of renewable natural resources and appreciate the need to use them wisely. This includes the dissemination of information through the press, radio, films, and television and through the Union's own publications.

RESEARCH to discover the best measures for conservation and to advance the study of ecology upon which all practical conservation depends.

ASSISTANCE in providing technical data for the conduct of practical conservation programmes.

ACTION on a national and international scale, by enlisting the co-operation of governments and international agencies in support of conservation programmes as well as in strengthening legislation and improving its enforcement.

IUCN Meetings

The Union convenes a General Assembly every third year in order to act upon issues of current importance, and to serve as a forum for discussion of conservation problems. Between 1948 and 1960, biennial general assemblies were held in Fontainebleau (France), Brussels (Belgium), Caracas (Venezuela), Copenhagen (Denmark), Edinburgh (Scotland), Athens (Greece) and Warsaw (Poland).

The next one in 1969 will be held at New Delhi in November.

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ANNOUNCEMENT

All articles on WILD LIFE published in "CHEETAL" and "Indian Forester" during a year, beginning from 1969 will be eligible for award of "CHATURVEDI PRIZE", previously for articles in Indian Forester only.

Hony. Sectary.

CHEETAL

Journal of The Wild Life Preservation Society of India

VOL. XI

NOVEMBER, 1968

No. 1

Ourselves

When an adolescent matures, he becomes reserved in his judgements; as CHEETAL matures under the co-operative care of its subscribers and the members of the Society, we find ourselves becoming less articulate on matters of opinion, more reliant on scientific fact. All that could be said on the subject of wildlife and its conservation in India, we feel, has already been said. What is needed now is ACTION. We need to know facts; the grist of statistics and data for the mill of ecology.

In this issue we concentrate on research being conducted in India on Indian wildlife, by Indians and others. This is a trend we should all wish to encourage. It is only when Indians, foresters, ecologists and amateurs, take to the forests and the wide plains to see and find out for themselves, that wildlife will be saved and appreciated. We welcome foreign nationals, who help us, but we must develop our own potential talent. And there is no dearth of keen and able men in the field as reports in this issue will show. We are proud to number among our most active members the recipient of the prestigious Nehru Memorial Fellowship for peninsular wildlife research, M. Krishnan, and we know that there are others working quietly behind the scenes to serve the Cause.

This, the twenty first issue of CHEETAL, will also be our largest in circulation, thanks to large orders from government departments. But we need more such to reach wider readership that needs us, that alone can make CHEETAL an even better journal. We look to our members in government and to friends to stimulate this existing demand, to place the journal in the way of people who control the reading of thousands under their care.

We have introduced minor alterations in the subject matter and the setting of CHEETAL and we would welcome comments from readers on these changes. We often wonder what our devout conservationists think of shikar stories, and what our shikari-readers think of fanatical conservation-articles. In an interchange of views between these two sets of members, we feel, lies great hope of useful discussion. We ourselves will continue to steer a balanced course between these two both faithful supporters of wildlife preservation in their own ways, but invite their views.

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EDITORIAL NOTES

Crocodylus palustris

There is an excellent body of research now available on that grand old mesozoic, predacious reptile, *Crocodylus niloticus*, the Nile Crocodile found all over Africa. Hugh B. Cott in 1961 was the first to make a thorough study of this species, which, together with that other bizarre pan-African citizen, the Hippopotamus, a herbivorous mammal, represented Africa better than zulus and explorers and cannibals in the days when Africa was DARK and the only roads into its heart were rivers, which are their habitat.

Little was known till Cott's work. Now we learn that the female croc. reaches maturity when she is 19 years old and 8 feet long; she might lay between 25 and 95 eggs at a go, and grow to 20 feet or so. Though cold-blooded, crocs retain a body temperature of between 22°C and 27°C by skilful peregrinations between sunlight and shadow, basking on hot sand and slinking in cool, deep pools of water, and air-condition themselves by gaping their mouths to expedite evaporation-cooling.

They have six kinds of volcalisation: Yapping and croaking in the young; a coughing hiss when cornered; the low growl of surprise when surprised or discovered incubating eggs; the bellow of the wounded croc. familiar to sportsmen; the deep, hollow, abrupt cough made by basking males during the breeding season, and the full breeding roar by males like a drum rattling: Vibrant, rumbling and sonorous, and seldom heard.

Now when will our humbler *Crocodylus palustris* of India get a similar biography? That is what we wish to know. Not to mention the more interesting tale of the gharial or the fish-eating cousin of the jheels and lakes. Do we, in fact, know anything at all about the species in India? We hear fantastic reports of agencies in India who should know better, planning to breed crocs. for the export of skins to western markets where they fetch higher prices. But surely, with the reportedly slow growth of the croc. such 'farming' will hardly prove lucrative, though export of the skins, whether 'farm-produced' or shot and then passed off as hothouse stuff, will certainly prosper and find certian excuse from restrictions on the plea of being "farmed" and not shot.

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Research Projects:

We reported earlier a proposal for a survey of the Gir Lion by an American ecologist. Now we have received further details of this project, which has been in the field for some time. It seems to us an excellent idea, as we said at the time, but we repeat that it might have been better if a project for training up some Indian ecologists had been undertaken. Even now, we have suggested this to the agency which is sponsoring and financing this Gir Lion work, from, we believe, PL 480 funds. There was much talk earlier on of using PL 480 funds to establish an Indo-American Foundation for disbursing funds where most urgently needed, and this should be pursued so that wildlife and other fields can be rationally helped, instead of being subject of ad hoc grants and aided projects.

Another American-financed and American-manned survey is due to begin in India on the blackbuck, the gazelle and the nilgai. Members of our Society, too, have been working on these Indian antelopes for sometime, but without support from any source, have made a little headway, as published in the report in 1964 c: *Wildlife in Open Country I: The blackbuck: CHEETAL Vol VII; No. I: pp 20-24*. It does seem to us a needless discouragement of local talent that though this report was found useful enough to be quoted and used liberally by Dr. George Schaller in his book 'The Deer and the Tiger', the authors or the Society were not even consulted by the sponsors of this project. The field of wildlife has proved capable of arousing genuine and sustained and useful honorary and voluntary work all over the world, and deserves encouragement. We hope the organisations concerned with such projects and with aid will give due consideration to the needs and merits of existing projects and work being done in India by Indians, and not help only non-Indian nationals, as has been to-date the general rule.

Animal Stories:

Animal stories have always been popular everywhere. Young and old, in west and east, have told and re-told, read and passed on such stories, and yet one seldom finds anything of factual or scientific interest in accounts of animals and birds which often ignore facts in favour of sensational anthropomorphic yarns.

That perennial enigma of the Himalaya, the yeti, aside, one often wishes there were more such stories. Norah Burke, one of our active supporters and members, writes the kind of story we need more of. And now we have read another, Gavin Maxwell's *Ring of Bright Water*, about his pet otter in the Scottish coastal areas where he lived in isolation with this loveable creature. Elsa, the now famous lioness is almost a house-hold word, and what the Elsa books by Joy Adamson have done for the African Lion needs to be done for the snow leopard and the red bear, the thar, the serow and the thamin, the takin and the goral, as for all the rest of the fascinating animals of the Himalayan palearctic zone.

It is not that people in India do not keep pets. We ourselves know several who have bizarre animal companions; but, rather, the choice is restricted by the availability. Too often one hears of army officers and even foresters who find cubs and kids of Himalayan animals and either give them away or otherwise neglect them. They should know, we feel, that animal companions of this genre can be very good fun. And also most lucrative for one who can learn their ways and write of them with sympathy and understanding, as Mrs. Adamson and Gavin Maxwell have both found after the record sales of their books!

* * * *

Several of our staunch supporters from outside India keep reminding us that the Society must start organising wildlife tours and study and photographic trips to sanctuaries and national parks. We know that the Fauna Preservation Society undertake to help with the organisation of these tours. Tours have been arranged to Africa, to the Galapagos, and elsewhere.

Since some of our members engaged in Himalayan wildlife research do keep undertaking trips to Himalayan areas, and many other members have long experience of sanctuaries, etc., in the plains the Society would be in a position to help if sufficient enthusiasm was shown. We invite members to write to us if they are interested in such tours, and if so, what areas would interest them most.

* * * *

Then and Now:

Himalayan Field Days:

Col. Fred Markham's Shooting in the Himalayas does more than provide nostalgia for the 'good old days': it gives a glimpse into a better world, when shooting was not the widely denigrated sport that it is fast becoming these days. Herewith some extracts from his diaries:

"A bharal is much quicker-sighted than any other animal I ever hunted, except for his big brother, the Ovis ammon; if he gets a sight of you, your chance is over for that day. In this instance we saw the flock some two miles below us. It was early in the morning and bitterly cold. We lay down. After hours, they started moving upwards, and my boy and his brother killed seven. They could have killed the whole flock had they wanted."

This carnage was committed near Harsil, where now a bharal is news!

"Wilson, on the 14th killed another male (ibex, in Spiti, their sixth!). On Friday we again met with a flock of ibex on the glacier. Stalking the flock carefully, we got within tolerable distance. One impertinent young fellow stood on a rock, with magnificent fellows close to him. I fired, and knocked the youngster off the perch. According to the natives, the ibex can go seven nights and seven days without stopping when really frightened. The other never stopped to look back.

Near Jispa, we found in the glacier of the Millang a herd of 15 ibex....."

I have been to Shilla in Spiti, and all around the Lahul and Millang valleys, without seeing a really good head in 1964!

We have heard from Dr. George Schaller, author of the *Deer* and the *Tiger*, that he is visiting Dachigam Sanctuary in Kashmir for a brief study of the hangul. Presently engaged in a long-term study of the African Lion in the Serengeti plain, Dr. Schaller is visiting India for a survey of the high-elevation Laya Sanctuary in collaboration with the Himalayan Wild Life Research Project. His trip is sponsored by the New York Zoological Society and the National Geographic Magazine.

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“Bear Cat in Assam” (Report in the press):

BEAR CAT FOUND IN ASSAM

“Gauhati, October, 10—The bear cat, long believed to be extinct in India, has been found in Assam, reports UNI.”

A bear cat, captured in Northern Kamrup recently, has been handed to the Gauhati zoo. It is stated to be the only bear cat in captivity in India.

The bear cat looks like a civet cat from the front and like a bear from the side. The one at the zoo here is 1 foot tall and about 4 ft. long, including a 2 ft. tail.

Now it is believed by most Indian wildlife enthusiasts that the Giant Panda is not to be found within Indian limits, except, perhaps, in the hills region between Burma and India. The smaller panda, or cat-bear, is known to occur well within India. *Ailurus fulgens* is found fairly freely in the temperate forests of Sikkim, Bhutan and NEFA. Mr. Stracey, author of *Elephant Gold*, *Reade—Elephant Hunter*, and *Tigers*, etc., saw several during a recent trip down a motorable road in south-eastern Bhutan. Mr. R.K. Dang and Mr. A.C. Burman have similarly reported the lesser panda from Bhutan and Sikkim, and we have ourselves seen them in areas of NEFA.

Evidently the animal reportedly found in Assam is the lesser panda, rendered “extinct” through the imagination of an ill-informed reporter. Interestingly enough, lesser panda are not arboreal but terrestrial in their feeding habits, using the trees only as a refuge for the night. The soles of their pads are hairy, their diet vegetarian and their looks like those of loveable and long-tailed teddy-bears. The Giant Panda, of course, is rare, and is the crest of the World Wildlife Fund.

We hear that Dr. Bernard Grzimek, author of ‘Serengeti will not Die’ and ardent protagonist of African wildlife, has raised a voice of dissent against the plan to construct a hotel in the Ngorongoro Crater Park, as it would not only be an eyesore, but also interfere,

with wildlife. We feel he is right, and we in India must plan all constructions in national parks and sanctuaries very carefully to avoid aesthetic and observational losses.

Dr. Stonehouse, of the University of Canterbury in New Zealand, has finally produced a viable theory about antlers and their uses to animals. According to him, antler growth follows the annual energy rhythm because it is connected with the breeding energy of the ungulates, being a mechanism for the dissipation of surplus energy and heat. He has demonstrated that heat is radiated by antlers. It was known that antlers did not play a prominent role in the breeding and threat displays of ungulates, but what it was that led their retention in the evolutionary process of natural selection of useful characteristics was not known. Now we know that this heat-loss function determines the size and shape of antlers.

Does a similar reasoning apply to horns, we wonder?

The World Wildlife Fund, through its National Appeals in the U.S.A., U.K. and Holland, has sponsored and financed the creation of a preserve for middle-eastern rare fauna at Yotvata and 6 wild asses have already reached the preserve for breeding and re-stocking of this once abundant creature.

With the re-election of the Duke of Edinburgh and Stewart Udall to the Council of the World Wildlife Fund, and the election of two more members, one from South Africa and one from U.S.A., the Fund now numbers five continents and ten countries amongst its 24 members. We wonder whether there is any member from India?

We hear that South Africa's Wildlife Foundation has launched their National Appeal, which is doing very well.

We also learn from W.W.F. that His Highness Maharaja of Baroda has promised to launch the W.W.F. National Appeal in India before the I.U.C.N. General Assembly meeting at Delhi in November 1969.

The Resources Division of the Planning Commission, which had convened a meeting on wild life preservation in March, 1965, once again brought together in Yojana Bhavan on the

14th of August this year an assembly of foresters and conservationists on the eve of the formulation of the Fourth Five Year Plan with a view to discussing uniform legislation and law enforcement, the administration of wildlife conservation programmes, the development of national parks, sanctuaries and zoological parks, the export of wildlife and its products, training of wildlife workers and research into wildlife ecology, safari promotion, wildlife education and publicity, ways and means, etc.

The meeting was attended by most Chief Conservators of Forests of the states of India, by representatives of conservation organisations like our own, and by eminent individuals in the field. To consider the items one by one, the Ministry of F.A. CD. and C. had circulated to all states draft model bills on wildlife laws and national parks, and these were discussed, though not all states had yet sent in their reactions. The I.G. Forests in this ministry had been placed in charge of a newly-created wildlife unit under an A.I.G. This unit would in future serve as liason between the wildlife units in states and the centre, and also with the I.B.W.L., which latter would thus be re-invigorated.

The President of the F.R.I. informed the meeting that the F.R.I. had received sanction for starting a six-month course for forest officers on wildlife, with the blessings of the Plancom and the Finance Ministry. He added that amateurs and experts would be invited to lecture to this course, and a research cell would further make this more useful. This seems, indeed, a valuable opportunity to use the talents of foreign and Indian experts in training up a corps of Indian workers, an idea we have often mooted ourselves.

It was stressed by several members that research must be encouraged by Indians themselves, and that very useful work had been done and was being done by people like Mr. M. Krishnan, who had been awarded the Nehru Memorial Fellowship for research on peninsular wildlife.

It was pointed out that publicity and education in this field were still short of adequate, and that funds were urgently needed for these activities. The meeting was to put up proposals for funds in the Fourth Five Year Plan.

Mr. Nag Choudhuri brought out the point that the entire ecological relationship between forests and wildlife, plants and animals, needed to be investigated for long-term planning. Habitat studies must precede conservation measures, he said.

Several speakers suggested that research funds should be sanctioned by the Centre, presumably to be routed through the I.G.F.'s wildlife unit, for the states or for specific projects. The D.G. of Tourism, Sri S.K. Roy, said his department was very keen to develop facilities at parks and sanctuaries and would willingly help in the development of such.

Some speakers suggested that there was less need for the meeting than for a meeting of the IBWL, but in his summing up the Chairman seemed to draw general support when he said that organisationally the IBWL would work in collaboration with the wildlife unit of the I.G.F., and financially, the Plancom would recommend the allotment of funds under the Fourth Plan under research, administrative, developmental headings, as also for additional, earmarked and sponsored projects. Though no decisions have been yet published, this was a most useful and historic meeting and should produce great benefits to conservation.

It might be useful hereunder to append an annexure issued by the Plancom which is informative.

ANNEXURE I

(1) **Pea Cock Feathers**

Only dropped feathers, under certificate from a Conservator of Forests that the birds were not killed be allowed for its export. The quota from the feathers be reduced from 3000 kgs to 2500 kgs (whereas 700 feathers weigh one kg., average for all lengths) and export of articles prepared from peacock feathers be freely allowed. Proper census of the birds be conducted by the State Governments or zoological survey of India.

(2) **Crocodiles and their skins**

Three species are found in India i.e., Gharial, Mugger and salt water crocodile. In view of slow breeding, and extremely low in population, the export of crocodile skins should be completely banned, while certain articles be allowed to be exported by foreign tourists provided they are purchased from the local markets. The species should be declared protected by law by the State Governments. Census should be conducted. The question of starting breeding farms of this species in the country could not be taken up for want of expert advice.

(3) **Python and their skins**

Rock python is available in India. Average length is 10-14 ft. but rarely 17 to 18 ft. The existing quota of 250 number of python skins not less than 12 inches width, per annum may continue. The State Government may declare python as protected species. Its census be conducted.

(4) **Water Lizards and other Monitor Lizards and their skins**

The water Monitor lizard, yellow oval-spotted monitor, Agra Monitor and common monitor, lizards are found in the country. Water Monitor lizard are usually up to 6 feet in length.

Annual export potential is 500 skins. Since Monitor lizards other than water lizards are useful in controlling rats and mice it is necessary that control is exercised in their killing and export of their skins. An estimate be conducted to assess the possibility of increasing its export.

(5) **Jungle Fowl Feathers and Necks**

Two species, the red jungle fowl and grey jungle fowl are found in the country. Feathers are mostly used for preparing bait flies for fishing. Because of great demand in the foreign markets for the neck feathers—which generally develop during their breeding season among the cock birds, it is feared that it is being over exploited, therefore, the Group has recommended complete ban on export of neck and neck feathers or skins of these birds and should be brought under Part 'A' of Schedule I to the Export (Control) Order, 1962.

(6) **Musk Deer**

The musk is found in musk gland situated near the abdomen of the animal. The average musk is 2 to 3 tolas and rarely an ounce. It is a very rare animal, being sought and killed for the lucrative trade of the musk which fetches Rs. 250 to Rs. 300 per tola in the country. The musk is used for medicinal and perfumery purposes. Japan, France and U.S.A. are in great demand of the musk.

As the quantity of musk exported from India is much larger than is known to be available from natural resources, it is presumed that most of the exported musk is not genuine but an artificial product made with natural musk as a base. It is not considered fit in the National interest to permit export of adulterated or supurious musk even for much needed foreign exchange.

Except NEFA, the musk deer is a protected species in all the other hill States. Since all the musk exported is not genuine, its export up to 300 kgs. per annum may continue, till the proposed investigation of purity of the exported musk is completed. The animal should be given full protection by the States and its census conducted. The National Chemical Laboratory, Poona may conduct research to encourage use of synthetic musk in the perfumery trade.

(7) **Deer Horns**

The deer and antelopes are the two families which provide anthers and horns. Except the following species which are included under part 'A' of Schedule I to the Export (Control) Order, 1962, the horns and anthers of other deer and antelopes are allowed to be exported.

These are restricted species

- | | |
|----------------------------------|--------------------------|
| (1) Brow antlered deer or thamin | (4) Four horned antelope |
| (2) Indian Gazelle | (5) Kashmir stag |
| (3) Indian Swamp Deer | (6) Black Buck |

The export of deer horns and antlers on production of a certificate from wild life officers/ D.F.Os. (that the horns were dropped or naturally shed) be continued. But State Government should submit annual statement of the deer horns permitted for export.

Census of these species is essential to control the export of their horns and antlers.

(8) **Lesser Panda**

They are found in eastern Himalayas. Annual export potential for the living lesser pandas is 25.

It has been accepted all the world over that it is wrong to exploit any of the wonderful variety of free living animals and birds to extinction. As the lesser Panda is a rare animal in the country, it is recommended that the export should be completely banned.

(9) **Slow Loris and Slender Loris**

Slow Loris is found in Assam, Tripura, and Chittagong and Slender Loris in the Western Ghats, South India.

These lumuras are rare species and need to be strictly preserved and their export strictly banned. The animals should be brought under part 'A' of Schedule I to the Export (Control) Order, 1962.

(10) **Leopard or Panther Skins**

Leopards are exploited for the sake of their skins which are in great demand in foreign countries. Whereas the International Union for Conservation of Nature has recommended all Governments of the world to introduce immediate control and restrict the import and export of the skins of jaguars, leopards, cheeta, spotted cats, etc. as there is threat to the continued existence of these species. However, it was recommended that except the skins of snow leopard, clouded leopard and hunting cheeta, export of Panther and leopard skins should be allowed freely till a decision in this regard is taken by the Indian Board for Wild Life.

(11) **Langurs**

(1) The golden langur, (2) Lakhimpur or capped langur, (3) Nilgiri Langur, (4) Malabar Langur, (5) Crested Langur, and (6) Common Langur, are considered for export. Under the present policy the export of langurs under S. No. 2 to 4 is allowed to bonafide scientific institutions by registered exporters, and langur under S. No. 5 is allowed up to 20 P.A. while of the last one is allowed up to 100 numbers. But the Group has recommended that except the common langur, other langurs be included under Part 'A' of Schedule I to the Export (Control) Order, 1962.

The Vanishing Rhino of India

By

M.D. CHATURVEDI

Trigger-Happy hunters with their blinding flash lights, high-velocity weapons, ubiquitous jeeps and easy consciences have brought about the extinction of about 30 species of mammals during the last hundred years. The species that readily succumbed to this wanton assault were naturally those that lacked alacrity, finesse, and ability to fend for themselves. Among such helpless creatures, the Indian rhino* stands high on the list of those that are on their way out.

Born and bred in the land of Buddha and Gandhi, the Indian rhino is meek and mild and not half-so-wild as it looks. Unlike its ferocious and unpredictable African cousins, the Indian rhino loves to live and let live. As further evidence of its non-violent nature, it considers two horns a needless ostentation. It sports only one, more as a symbol of its might rather than a weapon for fight. Even at bay it seldom gores its enemy; it prefers to bite. The horn is much more in evidence in the training of a baby by its mother.

Pre-historic Prodigy

Its enormous size, the armour-plate studded with tubercles that it wears, and the single horn that adorns its nose strike awe and compel respect from other denizens of the forest. The elephant, the king of the animal kingdom, gives it a wide berth; the tiger slinks away at its sight; and the panther hides its hide in mortal dread. No animal wants to measure its strength against that of this veritable monster which seems to have walked straight out of the dinosaurian days.

This pre-historic whale of an animal, reminiscent of the mastodons that stalked the earth in ancient times, once frequented the entire marshy tract skirting the Himalayas extending well over 1,500 miles.

Recent excavations which unearthed a pre-Aryan civilization at Mohenjodaro and Harappa in the northwest of India around B.C. 2,500—1,500, revealed the place of pride the rhino enjoyed in that dim and distant past. The vast majority of seals of that period preserved at the National Museum in New Delhi depict the rhino as the insignia of their might. The lion had to wait for recognition as a royal emblem until Emperor Asoka appeared on the scene, 264 B.C.

*The great Indian one-horned rhinoceros: *Rhinoceros unicornis*.

Babar, the founder of the Moghul Empire in India referred to the rhino in his hunting exploits in the Indus Valley around 1525. It was about the same time that the king of Cambay (north of Bombay) sought to impress King Emanuel I of Portugal by presenting him with one of his palace pets, a rhino which in captivity would eat out of your hand. The Royal household in Lisbon must have had a fit at the sight of this so-called pet.

Massive Monster

Looking like nothing on earth (except like other rhinos) this great one-horned creature is more like a Patton tank of the animal kingdom careering about on its stumpy legs absent-mindedly in mud and slush. In this gigantic Goliath, weighing $1\frac{1}{2}$ to 2 metric tonnes*, one begins to suspect Nature indulging in a caricature of its other creatures, but not for long. One soon gets used to the impossible proportions of a $3\frac{1}{2}$ metres long body supported by short legs measuring no more than 75 cms. Its shoulder height is approximately 180 cms. for male and 160 cms. for female.

For an animal conceived on such pharaohick dimensions, it has tiny eyes stuck like beads on the side of its head half way between its erect ears and nostrils. Its unseeing eyes are largely responsible for unexpected encounters with this otherwise well intentioned beast. The mother with a calf, however, must never be treated lightly and should be given a wide berth.

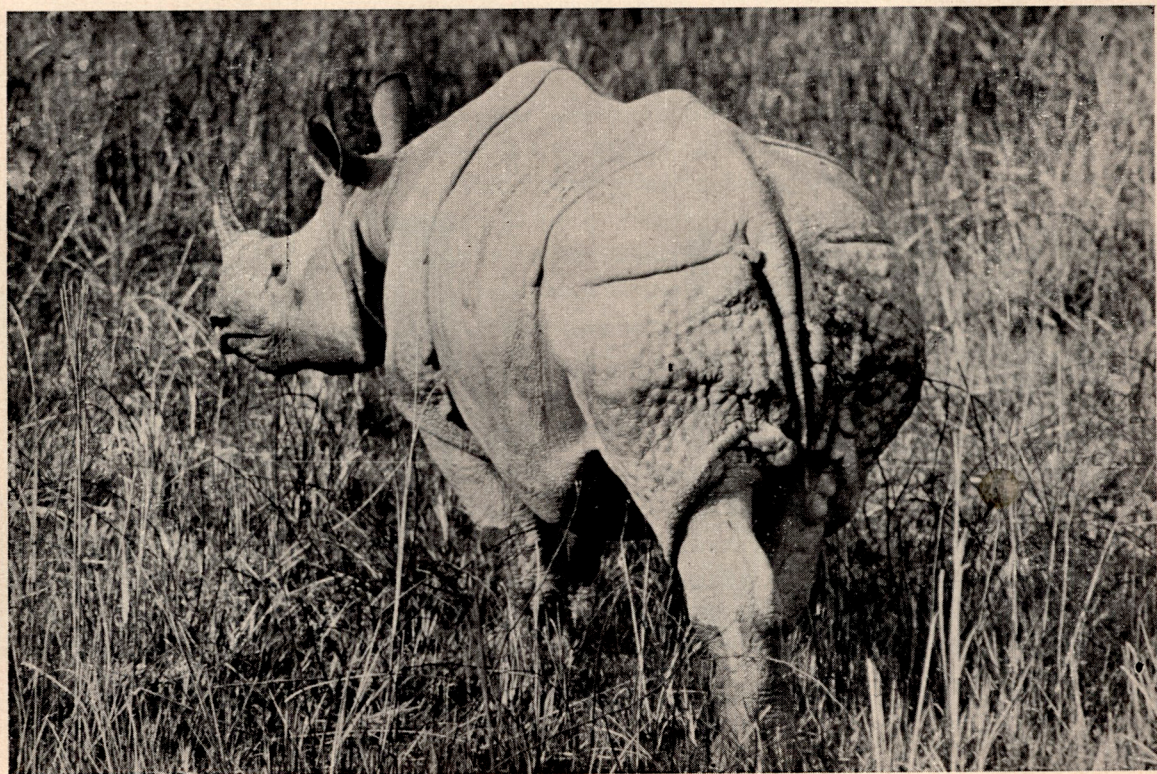
The rhino has but one consuming passion in its life, and that is to feed itself. While its black African counterpart lives on protein-rich leaf-fodder, the Indian rhino has to make do only with grass. What its intake lacks in quality has to be made up in quantity. It devotes most of its wakeful hours in devouring vast quantities of grass which it disposes off like a lawnmower. It settles down to its gargantuan meal in the evening and feeds practically throughout the night. To escape fleas and flies it wallows in muddy holes during the heat of the day. It avoids running streams. At a pinch it swims like a whale with its horn on its nose held high and ears sticking out.

Dull-Witted Dodo

Having never faced any struggle for its existence, the rhino has had no need to develop any of its senses of perception. It hears little and sees less. It lacks finesse and is devoid of even a semblance of intelligence. All it needs is to smell its way to a good grazing ground where it encounters little competition from its associates of the deer tribe and domestic cattle. Unlike other animals, it seldom senses danger and is apt to tarry around even when it does.

The rhino is a lone traveller. It loves its own company, and avoids intruders. It does not mind cattle and is often seen grazing along with buffaloes. It makes an exception, how-

*Male 2070; female 1,608 Kgsms.—Basle Zoo.



Rhinos in Kaziranga Sanctuary (Assam)

—Photos by Author.



Mohenjodaro Seals (2500-1500 B.C.)

Courtesy: Indian Museum, New Delhi.

ever, in the case of egrets which are often found riding on its back feasting on the ticks which the folds of its skin harbour. Unwittingly, these birds betray the whereabouts of their host, and act as veritable call-birds for poachers.

In its personal habits this wallower-in-the-mud has a peculiar instinct to go to the same place to drop its dung. The dung-heaps provide another clue of its proximity to the hunter.

Unwilling Breeder

The rhino is a reluctant breeder *pace* its proverbial horn. It takes a lot to coax the male to take notice of the advances of the female which take the form of a shrill whistle. In heat at regular intervals of about 45 days, the female pants and hisses and is generally off feed. At Whipsnade, the administration of sex hormones to the male was successfully tried in overcoming its aversion to mating.

The gestation period is about 16 months, (Whipsnade, 488 days; Basle 476 days). A single hornless offspring is born which keeps to its mother's heels for close on 2 years. Babies at birth weigh around 65 kilograms and tape about 125 cms. in length. Like horses, the mother seldom licks its offspring.

The rhino's span of life is believed to be about 50 years. In the London and Berlin Zoos the Indian rhinos lived for a period of 40 and 36 years respectively, not counting the age at which they were imported.

With no natural enemies, the rhino should have multiplied like the rabbit in Australia or the spotted deer in the Andamans. Instead, it is on its way out all over its haunts in Southeast Asia and Africa. The woolly European rhino became extinct during the glacial epoch. Two species of the rhino disappeared from India as late as during the nineteenth century. And our one-horned survivor no longer frequents its former haunts which once extended from the Indus to the Brahmaputra. It is now on its last legs biding its time in a tiny corner in the northeast. It would have disappeared like other members of its tribe, had special protection not been extended to it in the sanctuaries created for the purpose.

Hunter's Horn

Having no enemies to contend with in Nature, the rhino does the next best thing. And that is to grow its own enemy in the shape of the horn on its nose. Measuring between 12" to 15", the horn is worn by both sexes*. It is composed of solid ceratin of fibrous tissue suggesting modified hair. This solitary horn just sits on the nose, and if lost by accident grows again like one's nail. It is not connected with the bones of the skull as is the case with the

*Record 24". British Museum, London—E.P. Gee.

horns of cattle and antlers of deer. The average weight of the horn of a mature rhino is around 1,200 grams (max. recorded 1,776 gms.).

The horn has been endowed with fantastic aphrodisiac properties throughout Southeast Asia and China. Auctions in Assam during 1962 and 1965 fetched about 80 U.S. cents per gram of the horn. Its retail price would be about the same as that of gold.

People who pay such fancy prices for its horn are blissfully ignorant of the fact that the rhino which wears it is by no means noted for its potency. At Whippsnade, a young rhino had to be given a dose of hormones before it mated. Its celebrated horn proved of little avail in the matter. Nor do the so-famed aphrodisiac properties of the rhino horn find any support in the meticulous analysis carried out by Swiss Chemists.

But superstitions die hard. The fame that the horn has enjoyed through the ages persists despite all efforts to enlighten its gullible dupes. Not only its horn, but also its bones, blood, flesh and even urine have been vested with mystical properties. In Nepal, children wear its teeth as a charm to ward off the evil eye. Dried blood is used in indigenous medicines and fetches about a U.S. dollar a pound. Rhino horn cups were used in royal households in the Orient for detecting poison in drink and for imparting potent powers to water drunk from it. It is not easy to dispel the spell cast by the rhino on the credulous masses.

The horn, however, constitutes the chief attraction. At the Raffles museum in Singapore a stuffed rhino was deprived not only of its original horn, but also of its papier mache substitutes twice. It is for this nugget of gold on its nose that the rhino has been hunted through the ages. The temptation that its horn offers to the jungle folks is irresistible. They devise draconian methods like snaring, pitting and netting the rhino. The quarry provides a large target for the bow and arrow and for modern weapons it is not a sitting but a sleeping duck.

Not having learnt to protect itself, the rhino is doomed to extinction. Even in sanctuaries created solely for its protection in Assam and Bengal, it leads a precarious existence. The other day five rhino horns were caught by the Calcutta Customs booked from Assam as cycle parts for onward transmission.

Sprawling over 166 sq. miles along the bank of the Brahmaputra, the Kaziranga Sanctuary is fast becoming a rhino farm for poachers. They killed 37 rhinos in 1967 alone! This concentration of rhinos in a single area is like keeping all our eggs in one basket and asking for trouble.

The total number of rhinos now left in its existing habitat (including Nepal) would scarcely add up to 750, a number far below the critical point of the survival of such an unwieldy animal so unwilling to regenerate itself and so intent on committing *harakari*. The hunter has little to fear from this dullard of a dodo. If the horn had been mounted on the tiger or the bear, it would have been a different story.

Road to Extinction

India has already lost a smaller model of the one-horned rhino (*R. sondaicus*) which is now on its last legs in Burma, Malaya, Java and Borneo. Likewise has vanished the only two-horned diminutive species of India now known as the Sumatran rhino (*Didermoceros sumatrensis*) which occurs in limited numbers all over Southeast Asia, except in Java. The number of these vanishing survivors will not exceed a few hundreds.*

Of the two-horned African species, the black rhino (*Diceros bicornis*)—that runaway tractor—is able to fend for itself in South Abyssinia, East Nigeria and around Lake Chad. The two-horned white giant (*Ceratotherium simum*), next in size only to the elephant, has been rehabilitated in the Garamba National Park in the north of the Congo, in Zululand, and in the Kruger National Park. Their numbers are still in thousands and not in hundreds like those of the Asian species.

India owes not only to itself, but to the world at large to save from extinction its only surviving link with its ancient past in the shape of its one-horned rhino. It would be advisable to disperse this national asset in other suitable areas as an insurance against any mishap which might overtake this helpless animal in its existing haunts which are only too prone to natural calamities like earthquakes and floods. If the rhino can breed freely at the zoos at Whipsnade and Basle, it can be trusted to look after itself in other more hospitable regions in India and elsewhere.

*The European woolly rhino, dating back to Upper Eocene became extinct long long ago. (*R. antiquitatis*)

Inaugural Address at the 10th Annual General Meeting of the Society by Dr. A.N. Jha, Lt. Governors Delhi

Friends,

I am deeply conscious of the honour that you have done me by asking me to inaugurate this Conference. I am all the more grateful to you for having given me the pleasure of saying a few words on a subject which, though I know little about the techniques of wild-life conservation, is very close to my heart.

2. The American Congress, in the Wilderness Act, defined 'wilderness' in terms that are unusually poetic for legislated halls.

A wilderness is an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain, which is protected and managed so as to preserve its natural conditions, and which (1) generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

3. Wilderness has values greater than any price that can be placed upon the cellulose in its trees, the board feet of its marketable timber, the ores which it contains, or the hydroelectric power of its rivers. The wilderness is also a refuge for automated man. It is a therapist—a physician. The noise of civilization is one of man's worst enemies, becomes more than a hostile bacillus, it produces disease—not directly but through the fatigue and the weariness that it creates. In a wilderness the conscious and unconscious springs that create tension are relaxed; man comes to an understanding of his relation to the earth from which he came and to which he returns.

4. Wordsworth, Thoreau, Muir, Leopold, Murie—each experienced the healing effects of the wilderness of nature, and together they constitute an illustrious list of witnesses in its favour.

5. Wilderness helps us also to preserve our sense of wonder—the power to feel, if not to see, the miracles of life, of the beauty and harmony around us. A wilderness is a living library, richer in many respects than a library of books. It is too a research laboratory for the ecologist free of any of the man-made controls.

6. Charles Elton has shown that stability in a wilderness community depends upon the extent of the diversity within the community. In other words, the more plants and animals of different kinds that it contains, the less subject to upset it appears to be. The more complicated the biotic community as in the jungle, the more stable it becomes.

7. A wilderness area, free from man-made controls—is critical in the search for botanical and biological specimens useful to man. The reward may be a plant or fruit with disease immunity; it may be an animal parasite or a fungus useful in commercial or other processes; it may be soil bacteria or fungi useful in medicines.

8. Our national policy with regard to wilderness rules must be clearly defined in laws, regulations, and administrative orders that reflect governmental purposes through all levels—from the village, municipality, country, state, and on up to the Central Government. Such measures to be effective must stem from wide public approval and undertake to accommodate the conflicts between the preservation of wilderness on the one hand and the concept of industrial or other business use of forests, waterways, and beaches for commercial purposes on the other. The wilderness cannot be preserved against the pressure of population and 'progress' unless the guarantees are explicit and severely enforced, unless wilderness values become a crusade. Together with the enhancement of watershed protection, water production, wildlife habitat, hunting, fishing, hiking pack trips, camping, climbing, scientific research, and activities which many consider to be devotional, is the need for a country-wide and effective programme for the preservation of endangered species or species threatened with extinction. To a considerable extent existing public lands can accomplish much more than at present by recognizing those species that are rare and endangered and providing for them by land classification and special management efforts, so as to see that no species knowingly becomes extinct through man's action. All agencies of government, local, State and Centre that manage land share in this opportunity and responsibility.

9. Much more must be learned about such endangered species. We must know the reasons for population decline that have brought the species to the endangered condition and, on basis of that information, take the necessary steps to slow and stop further decline. Certainly habitat is necessary, and some of it must be sanctuary. But protected space is surely not enough; seemingly minor derangements of ecosystems may be critical for survival. To take only one illustration—that of fishes. Harnessing the waters of a river to provide hydro-electric power, to irrigate agricultural lands, or to control floods often creates conditions hazardous to fish. These hazards are especially acute where runs of migratory fish are concerned. In the course of their life cycle, these fish typically spawn in fresh water streams or lakes, the young (and sometimes the adults) migrate to the oceans, and later return to spawn. Dams obstruct spawning runs and may destroy the young fish on their seaward migration. Irrigation diversions often are death traps for young migrants. Resident lake and stream fishes also may

be affected, especially where the character of the water is changed, as from a cool, running stream to a warm reservoir pool. On irrigation projects, not only must the dams be provided with fishways, but the irrigation diversions must be screened to prevent the entrance of fish which would eventually find themselves stranded on agricultural lands. Many resident river fish are so destroyed. Conflicts between such water utilization projects and fishery needs can often be resolved by advance planning.

10. Then again we must deal seriously with the problem of pollution of environment, that is of air, water, and soil. What are we to do? Choices are commonly put before us in the false perspective of man versus an endangered species, economic necessity versus natural beauty, or the practical versus the nostalgic. Of course, we cannot do without the production of agriculture forestry, and fisheries, nor without the production of industry. Human population will continue to grow as will its aggregation into ever-larger metropolitan clusters, and this will mean more phosphates and nitrates in streames and lakes. We have learned much about the reduction of silt pollution by agriculture, but have got nowhere, to speak of, on the contribution of silt to our waters that comes from road construction and urban development. Nor are we sufficiently concerned about heat pollution of water and these industries which place a heat burden on water.

11. Let us assume that all of these accretions to our problem come from activities that are indispensable on the land, in the cities and by industry. The right question then, and it is seldom asked, is this: Can we afford not to pay the cos of restoring and then maintaining the environment in a condition that is livable for man. My answer is that we must afford the cost, whatever, it may be, for man is the dangerous and, in the ultimate analysis, the endangered species. I wish to say a few words also about the need for research. The case for research is generally harder to make than it is for other programmes. But it has to be realised that research is not a luxury that can be indulged only during times of affluence. Knowledge is the cause of affluence, and the tools of scientific methodology are the surest road to the improvement of knowledge and to affluence. It is not money that makes an agency affective in public service, although money is indispensable. It is brains. The natural resource in shortest supply, and the one in need of the greatest conservation efforts is the trained human intellect. Wildlife research, therefore, must precede formulation and execution of our programmes. This becomes all the more imperative as demand for recreational wildlife increases, and land on which it can flourish decreases in area, and, often productibility.

12. E.P. Gee, in a book that should be read by all quotes Pt. Jawahar Lal Nehru as having observed:—

“In no country is life valued in theory so much as in India, and many people would even hesitate to destroy the meanest or the most harmful of animals. But in practice we

ignore the animals. But life would become very dull and colourless if we did not have these magnificent animals and birds to look at. Our forests are essential for us from many points of view. Let us preserve them. As it is, we have destroyed them far too much. It is true that as population grows, the need for greater food production becomes necessary. But this should be by more intensive cultivation and not by destruction of the forests which play a vital part in the nation's economy. I welcome this pamphlet and I hope that it will lead people to think more kindly and more intently of our wild-life."

13. Gee goes on to refer to the fact that India has a long tradition of nature conservation. The Artha Shastra of Kautilya dating round about 300 B.C., refers to forests 'with game beasts open to all' which were specially protected. In 242 B.C. the Emperor Asoka's fifth pillar edict gave protection to fish, animals and forests.

14. Gee adds in sorrow:

"At the dawn of independence in 1947, however, much of this good work was undone by the ordinary people who suddenly realising that it was they who owned the animals, often went out into the wild places and massacred whatever they could find. I have been told the story of how a jeep-load of hunters sallied north in old Jaipur State and shot between seventy and eighty sambar in one night. Only one young one could be brought home to eat.

15. It was five years after Independence before the Government of India could start to devote time to the task of wild life preservation; the Indian Board for Wild Life was constituted in November, 1952."

16. Referring to the fact that under the Constitution of India, "Wild Life" is a State and not a Central subject, he states with considerable truth that the weakness of this set-up is that some States move forward at a slower rate than others depending chiefly on the amount of personal interest and energy displayed by the Forest Minister and the Chief Conservator of Forests of a State at any given time. "The Wild Life Boards of the States are powerless and can only advise if and when they be called on to do so. This is why India's small band of wild life enthusiasts, which includes Salim Ali, Dharmakumarsinghi, Krishnan and others is continually trying to enlist the support of the public by way of articles in the Press and other means".

17. He concedes that a greater effort has been made in recent years both at the Centre and in the States to conserve the rapidly diminishing wild life, but says quite rightly that this has not been enough to keep up with the continual and alarming increase in human population. This increase means that the problem of preservation in India is, therefore, very different from that in Africa, Europe, America, where the main danger comes from so-called 'sportsmen'.

18. As Gee sees it and all of us here see it, unless we cast our Wild Life Conservancy Plans in vast dimensions, there can be no doubt that, at the present rate of cutting vegetation, overgrazing by domestic stock and killing of wild animals in India, by the time public opinion can rally in support of wise conservation of wild life, there will be practically nothing left to conserve by A.D. 2000, only thirty-two years from now, except in Zoological gardens.

19. "The first to go will, generally speaking, be the larger mammals and birds, especially those which are edible. Smaller mammals and birds, particularly the latter which can escape by flying, will be the last to disappear. Imagine the year 2000, with the only wild life consisting of those creatures which can adapt themselves easily to thickly populated areas, such as jackals, rats, mice, vultures, pariah kites, crows and sparrows! Our sons and grandsons will never see the snowy-white egret, the noble lion and lioness with their playful cubs, the bison, the elephant, the magnificent tiger or even our national bird, the proud peacock. All this can and will happen, unless proper conservation measures can be taken in good time before it is too late."

20. To the layman the term 'conservation' is often a misnomer implying a mere hoarding of natural wealth. The real purpose of intelligent conservation, according to Havemeyer and others, is simply to guard against 'wilful waste' so that future generations need not be handicapped by 'woeful want'. It is the intelligent husbandry of our renewable natural resources, that they may provide for human needs, propagate their kind, and pass intact from one generation to another.

21. Wild Life conservation in the broad sense should mean the preservation of the native wildlife of an area, both as to the abundance and natural balance between species, in as near its virgin condition as possible, keeping in view the requirements of agriculture and other necessary human uses of the land. This may involve preservation of the present abundance of some kinds, the restoration to normal numbers of others, or the restocking of former species now locally exterminated. The real problem of conservation is one of efficient development, wise utilization, preservation of natural balances, and ensuring that no additional species are exterminated. Nature appreciation involving an understanding of the intricate interrelationship among all natural forms of wildlife that compose a balanced state in a given area, is the prime aim of any conservation teaching programme. For, if nature is truly appreciated, there will develop a strong motivating influence for conservation in all its phases. We must learn to live with the land, not off the land. In Japan the people are very land conscious. Even though every square foot of arable land is intensively cultivated, there is only slight evidence of erosion. The country, though heavily populated and extremely limited in territory, has established about twenty national parks. In that overcrowded country, those parks constitute more than 4 percent of the total land area.

22. If we are to acquire a new land ethic, we must make education a tool for understanding our with nature. Both biology and zoology supply many clues to man's intimate relation to the earth. The result is an increase in reverence, wonder, and awe of the earth and all its mysteries. The former idea was that nature was created in some fashion and then man was chucked on the earth, to live in nature but not as a part of it. He could sing 'I'm But a Stranger Here,' although he did not feel like a stranger." A doubling of our human population by the twenty-first century will be the most important single influence on our ecology. What actual impact it will have no one knows. None is wise enough to see ahead that far. The doubling of population may indeed make obsolete the best laid plans of to-day. So we need to cast our plans in vast dimensions.

23. We need a new conservation ethic if we are to have sanctuaries of wilderness left commensurate with the need. This ethic was thus described by Leopold "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." This means education, starting in the early years, which introduces reverence, wonder, and awe of nature, not the power of the bulldozer, as symbols of virtue. It means introducing biologists, botanists and ornithologists, as well as engineers and landscape architects, into our planning councils. It means the invention of new procedures that hold the hand of the developer until all alternatives to defacing rolling green hills or destroying wilderness sanctuaries are exhausted. And it means, above all else, making conservation a civic cause and uniting all of its advocates in a common front against the hundreds of threatened invasions that appear year after year.

24. In conclusion, I would like to quote E.P. Gee again—"if nature conservation could be considered important in India as long ago as 300 B.C. and 242 B.C. it should surely be accepted as a first priority necessity at the present time. The existence of sound nature and wife life conservation organisation in a country is a reliable indication of the stage of a country's progress and development".

Presidential Speech at the Tenth Annual General Meeting of the Wild Life Preservation Society of India. Dehra Dun on the 28th October 1968

Dr. Jha, Members and Guests,

It is with feelings of great pleasure that I welcome you to this Tenth Annual General Meeting of the Society. The Society has survived its teething troubles and enters the 11th year of its existence to serve the cause of wild life observation. It is an event of great importance that we have to-day amongst us to inaugurate our deliberations, our esteemed Patron, Dr. A. N. Jha, Lt. Governor of Delhi, who has distinguished himself in many a field of life and literature.

With the dawn of independence in India the cause of wild life suffered a setback because its protection had been associated and it was studied only over the barrels of a rifle.

India soon awoke to the 'new interest' of wild life conservation through the efforts of wild life enthusiasts, voluntary organisations like ours, and the doyen of wild life workers in India—Shri M.D. Chaturvedi, a founder-member of the Society—who, alas, is no more with us and who as Inspector-General of Forests worked tirelessly to organise the Indian Board for Wild Life with the blessings of the then Prime Minister Shri Jawaharlal Nehru.

The Society has been gaining in influence and utility by an appreciable increase not only in numbers but also in active workers for the cause of wild life preservation.

During the year Dr. Harold J. Coolidge, President of the International Union for Conservation of Nature and Natural Resources—a Life Member of our Society, visited India and the Society had the privilege of discussing with him wild life problems and the programme of the I.U.C.N. General Assembly Meeting to be held in India in November, 1969, at a meeting convened by the Ministry of Food and Agriculture, Government of India. The Commission on Education of the I.U.C.N. will be visiting the Society Offices during their visit to Dehra Dun and the World Wildlife Fund—mainly due to the efforts of Dr. Coolidge—has promised to help the publication of 'CHEETAL', journal of the Society in the not too distant future.

Financially the Society continues to be in the red because of the increasing cost involved in all our activities. The membership subscription is not being increased to make the membership accessible to all, though there is a strong case for increasing it.

Our efforts to save the tiger and panther have borne fruit and the Government of India has recently imposed a ban on export of tiger and panther skins.

The Indian Board for Wild Life needs to be activated and strengthened with representatives of voluntary organisations in the field and survey and research projects undertaken by Indian workers need to be given all encouragement and help by all interested in the preservation of our vanishing wild life heritage.

We are happy to learn that a scheme of education in the sphere of wild life conservation is being launched at the Forest Research Institute and Colleges at Dehra Dun and a scheme of organising a research centre is also being worked out by the President F.R.I., Dehra Dun. The research centre will go a long way in providing facilities for research workers in the field.

The Planning Commission of the Government of India convened a meeting for inviting suggestions for inclusion in the Fourth Five Year Plan at which the Society was represented. Winding up the proceedings the Chairman welcomed and appreciated the suggestions of representatives of voluntary organisations and the Chief Conservators of States. It is hoped that the Government will give high priority to wild life conservation.

The circulation of 'Cheetal' has increased and we are thankful to the Librarian, Bihar Government Libraries for ordering 300 copies of 'Cheetal' for educational institutions in Bihar. We wish others would follow the example.

The increasing number of student members—boys and girls—kindles a hope in our hearts that the future of wild life in India is bright and safe in their hands.

I am very thankful to all active members of the Society for their keen interest and hard work in the cause of wild life conservation, and to the members of the Executive and Advisory Committees of the Society, to the honorary office bearers and the staff of the Society for their hard work and the full measure of co-operation they have always extended to me without which the measure of success achieved would not have been possible.

Quo Vadis, Felis Tigris?

By

KR. ARJUN SINGH

Though the original home of the tiger are the northern and central regions of Asia, and though it is there that they attain their optimum size, yet India is the land which is best known as the home of the tiger, highlighted by the enormous bags whereby the Maharajah of Nepal shot 7 tigers in one day, 41 in three weeks and 120 in 68 days in the late thirties of this century. Those days are no more than a pipe-dream now, and the land-hungry advance of the seething population has served notice that the days of this magnificent animal may well be numbered. I write this with particular reference to the Nepal Tarai, but I have no doubt that the gloomy picture applies to the rest of India.

The disappearance of a species is seldom due to physical obliteration alone. It is the more insidious factors of destruction and disturbance of habitat and breeding grounds, and shortening of food supply which has the ultimate impact. The cheetah is in limbo, its habitat destroyed and its natural prey decimated. The lion has retreated from a wide Indian distribution, to its last fastness for similar reasons.

The saying goes that care killed a cat, but there is a serious danger that complacency may also toll the doleful decimal on the existence of the world's finest feline, and our most prolific dollar-earner. During the thirties and forties, into the fifties, a maximum of four tigers were allowed to be shot in a block. Now the Wild Life Department has imposed a limit of one per block, and in some blocks none are allowed to be shot. This control measure should theoretically solve the problem, and lead to an increase in the tiger population, but this is not so, and in fact the Western Circle of the Forest Department of Uttar Pradesh once the favourite stamping ground of the dollar earning shikar coys, appears to be running short of the essential commodity and these companies are in search of pastures new. At the same time, however, more firms are being licensed. This ambivalent policy, or lack of it, will reveal startling shortages in the not too distant future. Bag limits alone are not going to solve the problem of survival, especially when proper enforcement measures are not possible. The pundits even claim that the tiger population is on the increase because they say that more tigers are visible and tigers are now seen where they were never heard of in years gone by. The obverse is also, however, a truism that no tigers are to be found in favourite haunts of a couple of decades ago. The tiger is a solitude loving animal, normally intolerant of trespassers other than transient, in his beat consisting of about 25-30 sq. miles, where game is sufficient for his needs, and tigresses available over the mating season, and confident of his supremacy by the homage paid to him. Old timers will recollect that the tyro was told not to shoot



Camouflage



Gir Lion



The Indian Rhino

at small game in the vicinity of heavy forest for fear of scaring the elusive animal. All this has now changed, and the buffer grasslands have been claimed for cultivation, and crop protection licenses have been freely issued. The deer tribe attracted by the new crops have been slaughtered both in field and forest to a point where few are left. The tiger has perforce moved with his prey, and remained to live on the bony scrub cattle who subsist on the arid grasses on the forest fringe. Thus has come the transfiguration whereby the creature of the forest fastnesses now exist in the proximity of the roar of tractors and the raucous shouts of humanity. The reproduction ratio is adversely affected by continuous disturbance and the fact that sugarcane fields seem to be a favourite site for the dropping of litters by tigresses who have perforce moved into cultivation in search of prey. Here the harvest cropping presents a hazard for the April litter when tigresses are destroyed for demonstrating in defence of their young and the cubs left to starve, or they are smoked out with the resultant casualties. These tigers represent the vaunted surplus which superficial estimates claim as an increase in population, but is in reality a purely local migration to temporary breeding and hunting grounds. These casualties are not listed in any statistics, but form a considerable drain on the tiger population which is bound to show in a few years. Perhaps the effects are already being felt in the Western Circle? It is fortunate for the tiger that forests are essential for the economy of the State, and the present 13%, far removed from the 33% recommended by the Forestry Commission, does not stand to be further reduced. Yet the wholesale felling of timber trees like the Sal for quick growing varieties like the eucalyptus means that large areas of mature forest are felled and opened to cultivation, during the immaturity of the new plantations. This denies large areas to the wild life population over a considerable period. The status of the tiger is now very different to what it was in the days before Independence. There was a large buffer zone of swamp and savannah between the Reserved Forest and cultivation and the wild life population did not impinge to any considerable extent on the crops outside the belt, and gun licences were issued with circumspection. With the adoption of extensive colonization schemes, and the influx of displaced personnel from the Punjab and Bengal all cultivable land has been reclaimed.

Bringing cultivation to the edge of the forest, and the issue of crop protection licences as political patronage and an inducement for a subscription to development schemes have assumed mammoth proportions. The forest lands of Nepal are being similarly exploited and as far as one can judge the status of their wild life is even more precarious than ours. It is a far cry indeed from the astronomical pre-war bags of the Maharajah of Nepal to the single tigress shot by the Duke of Edinburgh in Chitawan after much effort in the late fifties, but I think I am correct in saying that Kanchenpur-Kailali in Western Nepal and Chitawan in the Central region are the only localities left where tigers are still to be found in reasonable numbers. Thus the breeding ground of tigers and the main source of annual supply to outer

Terai forests is dwindling rapidly, and the extensive felling and colonisation in Nepal which has caused an influx into the forests of Uttar Pradesh creating an artificial surplus which will soon vanish under the pressure of circumstances.

The Wild Life Bill of Uttar Pradesh which seeks to impose a measure of control on wild life outside the reserved forests has been on the anvil for nearly three years but has not yet been presented to the legislature and the situation as it now stands is, that Nepal is no longer an annual supplier of tigers to our forests, as due to exploitation they have moved into India in considerable numbers. Due to a shortage of game they have moved into cultivated areas, where there is no control on tiger shooting. Once this artificial surplus is gleaned-Kaput—!

It is essential that the Forest Dept., on whom the primary onus of preserving the the tiger population depends, should carry out a Statewide and properly organised census of tiger. Wild Life Sanctuaries must be developed as tourist attractions, and it must be realised that killing is not the only way of earning dollars. The African National Parks earn more foreign exchange than the shooting safari companies, but whereas their parks are well organised with metalled roads and residential accommodation, our sanctuaries are in name only. More control should be exercised on the allocation of blocks to shikar companies as apart from having first refusal on the choicest blocks, they may have only one client and many blocks. In Africa lionesses are not shot in the interests of the future population and theoretically the same should apply to the tigress, but the practical difficulty in recognition of the sexes makes a mandatory prohibition out of the question, but in most cases and especially with experienced personnel like shikar companies it is possible, and a beginning should be made by an enhancement of the royalty on the shooting of a tigress, as approximately fifty per cent of tigresses shot are either pregnant or with young at heel.

Sanctuaries should be made available on terms of long lease to these companies for purposes of development and tourism. This measure will not only provide funds for Wild Life management and protective staff, both of which are at present in short supply but will serve to divert attention to a facet of wild life which will remain in the coming years only to those countries who have read the writing on the wall in time.

The high export prices of tiger and panther skins is a dangerous sign and I cannot see, unless a great deal of rethinking is done, on ways and means to protect the tiger, that the supply is going to last for more than a decade or so.

[Government of India have imposed a ban on such exports. See Editorial Notes—Ed.]

Kashmir—A Sportsman's Paradise

By

G.M. MALIK

Director of Fisheries, J.&K.

Different areas of Kashmir including Kishtwar, Gurez and Ladakh share an assortment of fish and game which is quite unlike other parts of the world. For instance you find world famous wild goat and deer (hangul) on the slopes of Phamber and Wadwan and an elegant *Thar* on the precipitous rocks in Kishtwar, with the mighty mahaseer in the famous Chenab river below. In the high altitude areas Ibex, Serow, Red bear, snow leopard, etc., produce an unparalleled thrill for a sportsman before he decides for a little relaxation by resorting to trout fishing in some of the famous trout streams in the area. May be, a tourist would like to whirl bird shooting including Chakor and some of the beautiful pheasants namely Monal, Tragopan, Koklas, Kalij, Cheer pheasant and also the jungle fowl so are in other parts of the country. If stalking of the wild goat and the sheep and the battling of the mighty mahaseer does not strike the fancy of a visitor he can consider enjoying for a relaxing trout fishing in the famous vale of Kashmir. This can be conveniently combined with shooting of snipe, woodcock and a variety of duck and geese so plentifully available in the valley. One can fit these and other targets into a single programme of a visit.

The world famous valley, 86 miles long and 26 miles broad is deeply ringed by snow clad mountains having a large number of high altitude lakes full of fish and a network of streams and rivers full of Brown and Rainbow Trout.

For a tourist who is also a keen fisherman, the valley offers a variety of fishing experiences unsurpassed anywhere in the world as Kashmir has proved undoubtedly a fly fisher's dream.

It is undoubtedly one of our major pastimes since hundreds of people visit Kashmir only to fish. The fishing, though very good, is by no means expensive and the expenditure of maintaining trout waters is considerable. The trout have done better in Kashmir than in their country of origin. They grow to big sizes and provide excellent sport. The fishing is very well-managed according to international experts and is better than during pre-independence days. This is evident from the record catches of trout made in different streams as indicated below:—

- (1) Lower Bringhi—14½ lbs., (2) Middle Bringhi—13 lbs., (3) Lidder Wahdan—14 lbs., (4) Achabal—12½ lbs., (5) Nowbugh Lower—12½ lbs., (6) Kulgam—11 lbs., (7) Kotsu—11½ lbs., (8) Pohru—13 lbs., (9) Nambal—10¼ lbs., (10) Kishenganga—10 lbs., (11) Tricker—10 lbs., (12) Verinag—9 lbs., (13) Lower Bringhi—8½ lbs., (14) Kokernag—7 lbs., (15)

Sheishnag—11 lbs., (16) Aru—7 lbs., (17) Bumzoo—7 lbs., (18) Sindh Lower—8 lbs., (19) Upper Bringhi—7 lbs., (20) Sakhras—9 lbs., (21) Bidhar—4 lbs., (22) Erin—5 lbs., (23) Panzat—5 lbs., (24) Isthali—7 lbs. 2 ozs., (25) Tehsil—7 lbs., (26) Phryslin—5 lbs., (27) Sindh Middle—7 lbs.

One of the principle attractions of Kashmir fishing is its infinite variety and quality of fishing. Each of the rivers and streams fished has its own characteristic features. But there are three main "types":—

The larger rivers like Sindh, Lidder, Kishenganga are foaming torrents during the months of May, June and July with an occasional gentle current round the boulders where the big trout lie. Spinning is allowed in these rivers but fishing with the wet fly and weighed casts produces good results. These rivers are best in April, August and September when there is no snow. Side streams and other water channels near these beats provide another variety of fishing during the period and are very sporting.

The second type of water includes Bringhi, Erin, Madumati, Kulgam, Tehsil, Ningle and Ferozpora and similar streams where flies are generally the rule and wet fly fishing is good throughout the season.

Growth in these waters is phenomenal owing to high calcium contents of water and rich luxuriant insect food.

This Himalayan pleasure land of Kashmir had some 300 miles of trout waters ranging from an altitude of over 5,000 feet to 12,500 feet including some of the beautiful high level lakes, namely Vishensar, Kishensar, Gangabal, Gadsar and the recently stocked Sheishnag and Kounsernag. The main streams are within 40-60 miles of Srinagar and are divided into beats of two to six miles for fishing on daily or weekly basis. A visitor has more than 90 beats to choose. The good beats are located in the Bringhi or Lidder valleys and provide some superb fishing. For the beginners and immatures there are some very good streams like Kokernag and Verinag. To the north-west of Srinagar is Sindh river where there are about 10 good beats open to spinning throughout the season. Sindh Valley is the closest and the lowest beat is only 18 miles from Srinagar. In the far north is the enchanting Kishenganga in Gurez Valley across the Bandipore about 80 miles from Srinagar and connected by a jeepable road over Rajdhani Pass at 10,000 feet altitude. In this little valley there are some streams like Badwan, Koragbal which are full of trout. In the north-west are the two affluents of Wular lake, namely Erin and Madumati which are no doubt anglers' paradises and are at a distance of 35 to 38 miles from Srinagar. At the mouth of Wular some excellent mahaseer can be caught in the Jhelum upto Uri during July to September and also in Chenab and some of its tributaries known popularly as Tawis in Jammu, Rajouri and Poonch. A visitor who contemplates a fishing holiday should ask for necessary reservation in advance directly

from the Fisheries Directorate, Tourist Centre, Srinagar. On arrival in Srinagar he should consult the concerned officer of the Fisheries Department and find out what beats are suitable and available. He may also, if necessary, arrange through Agencies for tents and supplies or ask for accommodation in the Government Fishing lodges and Rest Houses which are suitably furnished and sanitarily fitted.

A light glass fibre or a split cane rod 8-8½" shall give satisfactory results. Tapered King-fisher line or bubble line give excellent results on the light but well balanced reel, 2-2½" diameter. The common flies which are useful are:—

Watson's fancy, Peacock, Coachman, Wood Cock and green, Teal and green, Jockscot, Invicta, Butcher, Jinger quill.

The fishing season commences from 15th of March and ends on 15th of October. Broadly speaking all fish which afford sport to the anglers are game-fish, but the exotic Brown and Rainbow Trout are certainly game-fish, par-excellence. Similarly mahaseer fishing and cheroo fishing which are premier sporting fish among the indigenous varieties give great fun when hooked on a spoon or a dead bait. The most popular methods for trout fishing are fly fishing and spinning and these types afford an active exercise amidst the most beautiful scenery our Kashmir can boast. The fish caught are the most sportive and their capture involves much skill combined with knowledge of insect life under water. No ground baits are required for trout fishing and the fish when caught and smoked on the bank of the stream is most palatable and delicious.

Every year the number of anglers fishing in our State increases but all of them are impelled by a common motive, that is a desire for relaxation after day to day task. One of the charms of angling is that it presents an endless field for argument, speculation and experiment besides excelling as a source of sport and relaxation.

Trout spawn in winter in running waters which are not too deep. The female sheds a few eggs in a gravelly red or a pit made by its tail fin over which the male emits a little milt for fertilizing eggs. The eggs are later covered by gravel with the help of tail and vigorous movements of the body. The process is repeated till all the eggs are deposited. The female completely exhausted and weak drops downwards and the male watches the eggs for a few days so that they are not eaten or disturbed by other males. Spawning season lasts from November to end of February.

An angler can stay in some of the well furnished fishing lodges which are situated on the banks of the trout streams in quiet and secluded areas but some may prefer to enjoy the charm of tenting. With a tent one is free to choose the location and there are some beautiful camping sites on almost all the streams. Fishing rights can be bought by purchasing a licence from the Office of the Director of Fisheries and the fish is the property of an angler. One has not to

return the catch and the permissible number of fish varying from six to twelve is the property of the angler. He has not to return the catch as in Austria where he can take it only on payment of additional cost. Waders are not generally required as most of the streams can be fished from the bank. But if one can easily afford a wader it will be useful in March and April when the water is cool and when it is not advisable to go to the middle of the stream without Waders. In March and April fishing is not good before 10.00 a.m. till the water warms up but in June, July and August early morning and evening hours are the best. In these hot months biggest fish are always caught at dawn or dusk. The Brown and Rainbow trout feed heavily after dark, when the large fish become active after sunset. The biggest fish of four pounder was caught by Her Majesty the Queen of Nepal at 9.00 p.m. while I landed a 7 pounder at 9.30 p.m. It is really enjoyable to fish in moonlit night provided the right type of fly is used and generally the Coachman is the best.

As already stated Kashmir is rich in the great variety of game birds and game animals. Shooting can be combined with trout-fishing or trekking as part of the shooting season coincides with a part of the trout fishing season, i.e., 15th March to 15 April and 15th September to 15th October. Thus bird shooting and fishing can be combined in one trip along with hiking. The usual season for shooting snipe in Shalabug, Anchar, Lasjan, Nowgam, etc. is 1st September to 30th March, duck and geese in Hygam, Mirgund, Pampore and Hokarsar is from 15th September to 15th April, Chukor in Nishat, Brain, Khonomoh, Khrew, Khiram, Watlab and Dara and pheasant in Lidder valley, Kishtwar, Madumati and Athwatoo (Bandipore), Nowbug, Simthan, Soorpharav (Sindh valley), etc. is from 1st October to end of February and Barasingha from 16th March to 15th September. In case a holiday maker has a few days more at his disposal he can go for the wild goat and sheep either on a summer big game licence commencing from 16th March to 15th November or winter big game licence which commences from 16th November to 15th March by contacting the Game Branch of the Forest Department. In case he is interested in black bear shooting it can be done anywhere in the valley and these are available plentifully in the corn fields or round about Apricot trees or elsewhere in the forests or in the Reserve for which a permit of the Game Warden will be necessary.

Apart from shooting and trout fishing a visitor has unlimited possibilities of watching bird life of Kashmir which is unique. It includes a variety of hill birds not commonly seen in other areas. The Golden Oriole, wood-peckers, partridge, shrikes, minivets, whistling Thrush, Blue Jay, starlings, fly-catchers, bee-eaters, king-fishers, Owls, Cormorants, Fishing Eagles, hoopoes, pigeons green and rocky, herons, turtle doves and some of the game birds already mentioned. For a casual visitor, for a man from the town, for a tourist looking for excitement of a different kind, for students and teachers interested in nature study and for one and all Kashmir affords a most enjoyable holiday amidst picturesque surroundings with bird

and animal life, both under water and above ground. These animals when seen in natural surroundings present a different type of picture from that of animals seen anywhere in cages or in the Zoos.

It was all this which attracted the great Roosevelt brothers to visit Kashmir including Kishtwar and Gilgit for a few months in 1925. One of them when on return was elected President of the United States of America. Those who have visited the wonderful scenic parks of North America have expressed their admiration for the mountains and river-valleys of Kashmir which is an earthly paradise where the alpine flowers, wild roses and lily adorn the mountains.

From The Sanctuaries

Wild Life Sanctuaries of Bandipur and Mudumalai

The wild life Sanctuary of Bandipur (Mysore) is rather a small reserved area of about 22 square miles within the once large game preserve of the Maharaja of Mysore, the so called Venugopal wild life park covering an area of 310 square miles. As shooting takes place in the latter area and as the wild beasts cannot obviously restrict themselves to man-made demarcations, i.e., stay within Bandipur sanctuary, there is marked reduction in the numbers in the already reduced population of tigers and other carnivores. Just prior to our visit we heard that the King of Afghanistan and his young son were in the park on a shooting spree and could get no tiger, only gaur and chital. He left disappointed to Madhya Pradesh. This shows how in spite of restrictions these rare denizens of the forest are being decimated. Another unfortunate factor in the rapid decline in numbers in wildlife is the proximity of the sanctuary to human habitation; the villagers seem to be in the habit of poisoning tigers and other carnivores as the latter invade villages to lift cattle as easy prey. A pathetic instance of poisoning a beautiful pair of a tiger and his mate was recounted during our recent visit. The wild life range officer who found these beasts dead in the area was unable to detect the perpetrator of this gruesome crime in spite of searching enquiries though the post mortem by the veterinary officer revealed that death in both cases was due to poisoning. The range officer told us that the first tiger skin was sent to the taxidermist in Mysore who has so nicely cured it that it now adorns the forest lodge in Bandipur. The tigress which must

have died earlier appeared to have been in a state of high decomposition so that the skin could not be cured satisfactorily in spite of the skill of the taxidermist.

It is indeed sad that tigers which are now in small numbers should further be decimated and that in this cruel manner of poison baiting. Two days spent in this area on the elephant and in the motor van yielded no satisfactory reward as no tiger or other carnivores were spotted in these forests once famous for tiger, leopard and bear. The adjoining area at the foot of the Nilgiris on the Madras side called Mudumalai wild life sanctuary with plenty of tigers are now practically bereft of these except for gaur, chital and other herbivores. There has sprung up now a hydro electric project and a new agricultural venture with West German collaboration. Though these are welcome in our present state of rapid increase in human population the inevitable setting up of a number of residential colonies has caused great hazards to wild life as the concomittent evil of poaching has increased in this once inaccessible region. Further south is the adjoining Wynad forest of Kerala where shooting is permitted and as previously observed the denizens of the forest not conversant with human made demarcations stray into the game area and fall easy targets to the trigger happy Shikaris who with modern rifle from a safe machan or a motor vehicle decimate the already disappearing wild life in this unnecessary killing, so-called "sportsmanship". We were told that there is a proposal to get the Wynad belt in Kerala adjoining Bandipur and Mudumalai declared a sanctuary when shooting will be totally forbidden. How one wishes this decision is expedited when the poor beasts will be saved from the depredations of the heartless hunters whose only aim is to maim, kill, kill, and kill. This reminds us of the observation of the famous naturalist Dr. Grzimek who said "If these sportsmen delight in killing let them lend a hand at the slaughter houses where there is killing galore and save the wild and rare fauna of the jungle for prosperity as work of art". Of course if these beasts should increase in numbers to dangerous proportions they should be kept under check by killing off the surplus by specially employed expert gunmen who will do the unpleasant job as a piece of duty even as measures are taken for eradication of unwanted pests like rats, etc. We have however not reached that stage yet.

I may incidentally mention a distressing sight on the trunk road where a miserable looking cow was lying dead, the result of poor health, starvation and forced march to a slaughter house in Kerala. We were told that large numbers of decrepit unserviceable cattle are daily driven along the road to Kerala as cow slaughter is prohibited in Mysore. Obviously these cattle in such poor health are unequal to these long marches perhaps even in the hot part of the day and succumb enroute. This poses a problem why this untold misery could not be avoided by permitting the slaughter in local slaughter houses instead of these forced long marches causing so much suffering and sometimes ending in agonising death en route.

A.S. Venkatachalam

From the States:

MADRAS

Bison in the Biligirirangan hills have reportedly died of rinderpest, and the department has instituted efforts to vaccinate animals to prevent spread of the disease.

MYSORE

A similar report from periyar claims the death through rinderpest of several hundreds of bison, and similar attempts at vaccination after tranquillisation are to be made. It is reported that tranquilliser gun equipment has been offered by a friendly foreign government, and the G.O.I. has agreed to pay the transportation costs.

ANDHRA

Our correspondent from Sileru, in the Chintapalli hills on the Andhra-Orissa border writes that recent drought led the tribal konds, etc., to organise a drive for game, with the blessings of the administrative authorities and that several deer and one bison were killed for meat.

He further says that the Sileru area, once so rich in bison and other characteristic fauna, is finally becoming like the rest of A.P. which have been opened by multi-purpose projects and dams, etc. What price the Sileru dam?

BENGAL

All our efforts having failed us in eliciting a response to our letters from the so-called Wild Life Preservation and Game Association of Calcutta, launched with fanfare in the papers we have been following with frustrated curiosity the statements of their Chairman in the readers' columns of the papers regarding the Sundarbans man-eaters. Recently, the 'Chairman' said that permits must be given to sportsmen to shoot man-eating tigers in the Sundarbans. We wonder how even the best of sportsmen can ever distinguish between man-eaters and normal tigers just by looking at them without first shooting them, if even then?

ASSAM

A correspondent has informed us that there are still fair numbers of bear-cats in Bhutan, and that he saw them descending to and crossing the highway late in the evening, where they were blinded by the headlights and slyly continued their nocturnal peregrinations.

BIHAR

Bhainsalotan, and the adjacent forests of the Indo-Nepal border along the Rapti valley, have become the strongholds of smuggling and poaching, informs a correspondent. He has a farm near there, and often visits the Tiger-Tops organisation, which undertakes to show tigers and more aspects of Nepal's hospitality to foreigners. We are also told by our informant that musk-pod, pheasants, rare animals and skins are all being flown abroad through Nepal, and sometimes from Calcutta, and that this region is the channel of the nefarious trade.

Last year, it was the drought. Now, the floods. We hear that wildlife has suffered considerably in Bihar and Bengal as well as in Assam, from the recent floods, but details are lacking, apart from stray instances of elephants or other animals being washed away and drowned.

U.P.

A particular hill-forest block in the Barkot and Singtur ranges of the Tons and Jamuna Divisions of this state has been reconnoitred by a member, who says he has found a large stock of pheasants and serow living a sheltered and undisturbed existence in a naturally sheltered area, where they should be preserved. We are writing to the Department to investigate this news further.

RAJASTHAN

The Forest Department of Rajasthan has conducted a census of blackbuck in the state. The figures are not available, but this is most encouraging news of a healthy trend.

M.P.

A state—run shikar organisation under a Conservator of Forests is being planned in M.P. to set an example for the functioning of such organisations.

REVIEWS

The Land and Wildlife of AFRICA by Archie Carr and the Editors of LIFE, published by Time-Life International in the Life Nature Library with an Introduction by F. Fraser Darling

We have already become familiar with the superb productions in this collection from Time Inc., but this companion volume to the Land and Wildlife of Tropical Asia is certain to set the pulse of all naturalists and even of casual readers throbbing with the excitement of discovery. For here in one volume we are given the entire astonishment of the most fabulous ecological community on earth, more akin to pleistocene variety and richness rather than to our drabber period. Whether the African animal landscape is a Climax Community in the context of the principle of ecological succession or not need bother only the ecologist and the professional manager, but that it still remains the most variegated and magnificent fauna is of interest to all; its survival should concern the shikari and the naturalist, the governments of Africa and the conservationists and scientists of the whole world.

As Fraser Darling, the author of the renowned, classic ungulate study, *A Herd of Red Deer*, says in the Introduction, startling discoveries are emanating from Africa in the field of animal behaviour, of which the discovery of the okapi in 1900 and of the African peacock in 1937 are only secondary in importance. The African habitat is put to different uses by different animals, and is one of the most efficient mechanisms for the turnover of matter to energy. Thus, wildlife preservation is dependent upon HABITAT PRESERVATION. A lesson highly topical to Indian problems to-day. Plant and animal communities develop complex eco-systems, and the production of even one gap through extinction or careless range-management may lead to a reduction in efficiency of the energy-conserving and energy-circulating system. Each plant and animal has its NICHE in the natural system, and this must be preserved.

Follows a lavishly illustrated description of the Dark Continent, its lakes and rivers, its grasslands and great game, the carnivores and the Tropical Rain Forest environment. Its insular mountain communities miles above the equator, and the prospect for the future traced from the beginnings of conservation and the Nairobi Conference which put African wildlife on the map of rich American Foundations with lavish funds for research at their disposal.

The lessons in all this are clear for those concerned about the Indian conservation movement; we must tackle our own problems. The African native did not have the benefit of the Indian foresters' and conservationists' earlier education, and the African nations were wiser in benefitting from foreign assistance in this field. We in India have already a body of technically competent and experienced people in the field, and prudently pursued, our policy of using expert assistance from foreign nationals should help Indian wildlife similarly, though we must ensure that our own foresters and conservationists and zoologists and botanists are not discouraged by too much reliance on foreign personnel from working out the problems

themselves. The African pattern cannot apply blindly to Indian problems, but this book throws valuable light on the pattern and on the adaptations we will need to make.

An excellent volume, indispensable for the layman and the specialist in the field; it is to be hoped that Time-Life will see fit to produce a similar one on India, too.

Hari Dang

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The Naked Ape by Desmond Morris (Jonathan Cape, 1967; 30 shillings)

One of the illustrious members of Niko Tinbergen's Animal Behaviour Group at Oxford, Desmond Morris's sub-title to this original volume makes clear the intention: A Zoologist's Study of the Human Animal.

For that is what we are, according to the vogue of comparative animal behaviourist ethology. Our place is with the 192 other species of apes and monkeys, from whom we differ mainly in the absence of fur. The genetic legacy of the anthropoid ancestry of man is once again the "in" thing, after a few decades of soft-peddalling since Darwin and Wallace. Studies into Animal Behaviour patterns have provided abundant evidence of the primate nature of man, whether in his social or sexual life, whether in aggression and affection, religion and diet and culture. In all our activities and inter-actions we seem to display the pattern set down by our hunting ape ancestors.

But of more interest to the animal ecologist and the conservationist is the history of environmental changes and adaptations brought about, and their process. How man evolved from the insectivores of the age of the dinosaurs; how the carnivores and the ungulates of the savannah almost beat the apes in the race for survival, and how finally, through neoteny and selective pressures, through differential heredity and transmission of favourable characteristics, the human animal stood on two legs, wielding weapons which grew sophisticated with time; how the pair-bonding of human marital organisation began and why it survives to-day, and how we might have lost our fur, and into what highways and by-lanes of evolution we are headed.

These and many others are the exciting discoveries of Dr. Morris narrated in simple terms which even the layman can and must understand if he is to learn to know his past and plan for his future with wisdom.

Those who have read Dr. Morris's *The Mammals: A Guide to the Living Species*, and *Men and Pandas*, will want to read this volume particularly, but every thinker on the predicament of man must ponder the issues raised in *The Naked Ape*.

Hari Dang

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**The Land and the Wildlife of TROPICAL ASIA by S. Dillon Ripley and the Editors of LIFE,
Published by Time-Life International in the LIFE Nature Library**

From the pen of the Secretary of the Smithsonian Institution in Washington, the doyen of Conservation organisations, comes the brilliant portrayal of a lush world too long neglected for the more gaudy and obvious mysteries of Africa and elsewhere.

In the pattern of magnificently illustrated volumes in the LIFE Nature Library, this volume finally introduces, if it does not even attempt to fulfil, a long-felt need for an authoritative work on the south-east Asian world of animals and plants. This cornucopia of natural abundance is finally explored and explained by Dr. Ripley, with an introduction by Tom Harrisson, Director of the Sarawak Museum in Malaysia. The book begins with a description of the South-Eastern Realm, including sub-Himalayan India, the arcuate islands off the mainland coasts, and the monsoon lands.

The ecological succession and the animal communities of the Rain Forest, the estuarine and tidal forests and swamps, the islands' insular vegetation and animal life, and the rarer and threatened species like the Sumatran rhino and the Orang-utan are all considered in the context of the biological inter-dependence of the region's eco-systems. The Human Invasion of the Promised Land is the last and the most exciting chapter, which places into correct perspective the place of the multifarious nations and races of south-east Asia, and the role that animals must play in the greater prosperity of the region.

Another very useful book from the publishers of LIFE.

R.K. Dang

**Great National Parks by Richard Carrington, (Published by Wiedenfield and Nicholson,
85 shillings)**

We have seen before this, many books on the National Parks of the world or of other countries, but this is a book with the difference that wildlife and conservation find first place in its approach and treatment. As such it will be welcomed by all who value conservation of nature and natural resources. Tourists and trippers to National Parks anywhere the world over would also like to read this comprehensive volume, profusely illustrated by wildlife photographers and the author.

An introduction on the philosophy of National Parks and the Conservation Movement is the book's statement of its plan and objective, which, (incidentally, like most works of the nature, this was financed and sponsored by organisations abroad and not only by individuals), is then set forth in colourful and interesting detail in the succeeding pages.

Sections are included on North America, Africa, and one on Europe, Asia, Australasia and South America. In each section the major sanctuaries and national parks are described and animal species characteristic or threatened are discussed and pictures included where

suitable. Useful appendices on bibliography and suggested reading and sources of information make up this most interesting and authoritative book.

Some lacunae are more significant in revealing the shortcomings of our own sources of information and in our own policies and execution, than in the author's treatment of his subject. There are only 2 national parks included for India, Kaziranga and Corbett. Nothing of the Himalaya is included, but that might be because Mr. Carrington's sources of information must have been non-Indian nationals who would know very little about the high mountains or the sanctuaries like Nanda Devi or Gobind Pashu Vihar.

A most excellent book, and it would be a great boon to Indian wildlife, and to tourism in India, if a similar book covering India's national parks and sanctuaries could be produced.

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The Territorial Imperative by Robert Ardrey

Mr. Ardrey is a playwright-turned ethologist and amateur of zoological thinking. It must be confessed that many find he is more successful in his latter amateur capacities, but that is less to denigrate his dramatic successes which are substantial, than to laud his notable achievements in bringing recent developments in animal ecology, ethology and the evolutionary process to the forefront of the intellectual stage.

In his first essay into his hobby, *African Genesis*, he took the world by storm with his revelations of the evolution of man in the continent of Africa, based on the findings of archaeologists working there. Now, he brings us his compilation of theories and findings which conclusively establish his thesis that human societies and institutions continue to be shaped by primate backgrounds. In this context, as we have known for long, it is not the sexual urge which is paramount in the intra-specific social inter-actions in animals, but the territorial urge. Territoriality as an instrument in game management had already hit the headline with work on red deer, but it was discoveries of the territorial urges and battles of the Uganda Kob and the Sable antelope that led to the realisation that the territorial imperative applied to almost all species. Mr. Ardrey carries this finding the further logical step of demonstrating how nations and human individuals in their behaviour to each other are guided all unconsciously by this same essential drive. International peace, accordingly, depends on our finding some way to sublimate these primitive urges.

A thought-provoking book for all.

Hari Dang

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TIGERS? P.D. Stracey (Arthur Barker) 21 s.

This is a small book on the tiger written by a forest officer who knows his subject. The book follows on the heels of some others published recently on the same subject by authors who had possibly done more research but did not have the long experience of Mr. Stracey. The book traces the history of *PANTHERA TIGRIS* in the various regions and brings out the remarkable adaptability of this beautiful animal in meeting the challenges of terrain, climate and threats to its very existence. The author makes an important point when he says that "no carnivorous animal can survive indefinitely without adequate supplies of its natural food" and that this has caused the tiger to disappear from large areas in Central, Western and Southern India. A similar situation may soon prevail in the North if game protection and its laws are not fully implemented.

The book covers the tiger's behaviour in relation to man and the animals amongst whom it lives. Not everybody may agree with the author that some tigers behave as "arrant cowards". The king of our forests is afraid of the man who has humbled it for centuries not with his own physical prowess but with instruments and weapons of destruction.

The book is full of interesting observations and anecdotes. It is well printed and contains a large number of excellent colour and black and white photographs—though one could wish that more of them were from the jungles than from zoos or inside enclosures. The book is a valuable addition to the wild life lovers' library at a modest price.

K.P.

Letters:

Sir,

I am a rare visitor to the Doon, and only once have I been out fishing. We went to Satnarain, where we found fish floating down the river under the bridge and below it, and boys from a school were swimming about, picking them out. I heard no bombs, but the master in charge of the boys told me that bombs had been thrown by some people early that morning. I had no permit, and was not fishing, but my friends with me were, and they caught nothing, coming back with nothing to show for their labours and their eleven-rupee permits.

I would like to know if any permits are issued for bombing of fish, for that is more likely to yield results than spoon-fishing in waters which are bombed. Till the authorities can ensure that bombing does not take place, should they not reduce fishing permit fees, to encourage the right sort of angler to visit and to keep bombers away?

Yours etc.

R.S. Saran, New Delhi.

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Sir,

We have read in the papers of the award of a fellowship for wildlife research to Mr. M. Krishnan, by the Nehru Memorial Trust. Would it not be possible for the Society to seek similar assistance for its own research projects from the same source?

Is there any Central Agency which co-ordinates the kind of research work that needs to be done? For example, when foreign nationals visit India for research work, do they not fulfil felt needs, or do they merely suit their own convenience, as they well might since they spend their own money.

I am a zoology student myself and would like to know what you can do to help.....

Yours etc.

Delhi University.

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Sir,

At times, contradictory and misleading reports come to be circulated both within and outside India that our country's wild life, especially Tiger population, is getting very much

depleted because of several factors, inclusive of improper attention and faulty approach on the part of the authorities concerned in exercising effective checks over the destructions wrought by poaching and other illegal shootings. This acts as a damper on the all out efforts to promote the interests of shikar tourism in India with greater emphasis on the fine and exciting opportunities for shooting the game by cameras, and thus provide increased foreign exchange earnings for the country, so badly needed.

Our Association is equally interested in the conservation and orderly development of the pride of Indian jungles—the Tiger, and all other wild life. Based on our experience we must say that especially in the period following Independence the Forest Department authorities despite their numerous and heavy responsibilities are quite devoted to safeguarding and promoting the best interests of our wild life.

“*Cheetal*” is indeed a very useful and interesting journal devoted to the cause of preservation of India’s wild life. As such, I believe, in your archives, the information regarding the past and present estimated population of certain, if not all, species of Indian wild life, might surely be available. May I, therefore, request you to kindly let us have the following information regarding *Tiger* only :

- I Present estimated tiger population in India, preferably different States or area wise, to the extent possible.
- II Any available estimates of the tiger population in the pre-Independence era, say in the period between 1901 to 1920 and just prior to 1947.

While obliging us with the requested information, it will be appreciated if the basis on which the estimates have been arrived at and the period to which they relate, could also please be specified.

We shall be grateful to hear from you soonest possible, since this information will be of interest not only to ourselves but also to the sport and wild life photography enthusiasts in India and abroad, who may have been misled into feeling that because of general indifference on the part of every body concerned, tiger have now become rather a rarity in India ! Awaiting your early favour and thanking you in advance,

Yours etc.

(Dinesh S. Shukla)

Member : Executive Committee, I.S.O.A.

Pratibha Bldg., Wardha Road, NAGPUR-1. (MS)

We appeal to our members to help by supplying information. We ourselves do not have up-to-date figures. We believe Mr. H. Abdulali of the B.N.H.S. is working on estimates of tiger populations—Ed.

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Sir,

Recently I visited the Dandeli Wild Life Sanctuary in North Kanara district in Mysore. With its area of 80 square miles spreading over typical Western Ghat country of steep forest clad mountains, deep gorges and narrow valleys, it can rival any other place in India in scenic beauty.

The area was declared a wild life sanctuary in 1955. However, even after official protection of more than a decade, the position of the wild life is not happy and moreover its future seems to be bleak.

Kali river forms the northern, eastern and southern boundaries of the sanctuary and Dendeli-Mandurli road forms the western boundary of the sanctuary. Dandeli town with its paper, plywood and manganese industries and population of 20,000 is right on the boundary of the sanctuary. These industries depend heavily on the supply of raw materials viz. bamboo, teak and manganese ore from the adjoining sanctuary. This has resulted in heavy truck and human traffic inside the sanctuary area. There is no place inside the sanctuary where there is no sign of fresh human interference. Vast tracts of forest have been fenced to protect the new plantation from wild animals and cattle- a sanctum sanctorum in reverse to protect the human interest in a wild life preserve. Consequently the animals have retreated to the inaccessible part of the sanctuary.

One can still see a few bison, wild boar, chital and sambhur in Sykes Point area, one of the scenic points overlooking Kali river. Unfortunately this site has been selected for a power generating station for proposed Kali Nadi Hydel Project and at present sample boring is being conducted here.

There are various scenic points inside the sanctuary. However to my surprise I found that most of the roads leading to these points were blocked by fallen trees or stacks of bamboo neatly laid out in the middle of the road.

It is obvious that the nearby industries cannot be denied their legitimate supply of cheap and readily available raw material. But then what is the purpose of creating a sanctuary there? what is the use of such a paper sanctuary, with its modern guest-houses, bus to carry tourists around where ratio of human beings and trucks to animals seen will be more than 50? There used to be a game warden in Dandeli. I was told that the post is vacant for the last few years. The authorities are right in their decision of not having a game warden as there is hardly any game left!

In future, to prevent such situation occurring elsewhere, I suggest that the Indian Board of Wild Life should formulate minimum requirements and standards for a wild life sanctuary and persuade the authorities to adhere to the same.

Yours etc.

Jaymal Khatau

Students' Corner:

Letter from the Doon School Wildlife Society:

We have heard nothing from our friends of Shillong who started a magazine, *Egret*, last term. We wrote to them twice, but they did not reply. Could you, meanwhile, tell us what projects we might pursue at our school? We have a very keen set of active members, apart from the remainder who are all, 140 of them, readers of *CHEETAL*. We have prepared a map on the national parks and sanctuaries of India on a large scale; and another on the wildlife of Dehra Dun, showing with signs and flags, each tiger and herd of chital known to exist in the valley. These maps are useful for educating the boys when they join.

Could you also please help us by sending us some good pictures of wild animals for use on our board? And we would also like to know what shooting rules are in force at least in Uttar Pradesh.

[We append below the existing shooting rules in U.P. as issued by the C.W.L.W.'s department. —Ed.]

Big Game Shooting in U.P.

RULES & REGULATIONS

Issued by the Chief Wild Life Warden, U.P.

(1) Applications for permits in form 'A' for big game shooting should be addressed to the Chief Wild Life Warden, Uttar Pradesh, Lucknow and for other kinds of permits to the respective Divisional Forest Officers. The applications may be sent on ordinary paper.

(2) Each application for big game shooting shall be accompanied by a non-refundable application fee of Rs. 5/- either in the shape of crossed Indian Postal Order duly endorsed in favour of the Chief Wild Life Warden payable at Lucknow G.P.O. or treasury chalan remitted into the treasury under head 'LI FOREST'.

(3) Allotment of shooting blocks for shooting permits in form 'A' shall be decided by drawing of lots. For the purpose of the draw applications shall be invalid if received earlier than ninety days or later than seventy-five days before the first day of the period, for which the permit is required. For example, an application for permit for shooting from 16th December to 31st December should be received between 16th and 30th September.

(4) Drawing of lots shall be done on the 10th of the month following the last due date for receipt of application in the office of the Chief Wild Life Warden, U.P., Lucknow at 11.00 a.m. For example, the first shooting draw for December, shall be held on 10th October.

(5) For the blocks which may have remained vacant after the first draw a second draw will be held on the 30th of the same month in which the first draw is held. Applications for these blocks will be accepted upto 28th of the same month. For example, second draw for December shall be held on 30th October.

(6) The blocks which may have remained vacant after the second draw, will be placed at the disposal of the concerning Divisional Forest Officers who will allot them to the interested persons on the basis of the first come first served. These blocks shall only be allotted to the residents outside the districts in which the block is located, and not to the residents of the same district in which the block is located.

(7) Intimation of allotment of blocks shall be sent to the successful drawees by registered post acknowledgment due.

Similarly intimation to the unsuccessful drawees will also be sent alongwith the list of blocks available for the second draw.

(8) Allotees will be required to deposit the prescribed shooting fee within twenty days from the date of despatch of the result of the shooting draw, failing which the allotment will be automatically cancelled, and the block will be offered to the second drawee. If the 2nd drawee fails to deposit the fee within 10 days period, the block will be declared vacant.

The shooting fee will be remitted in the same manner as application fee under rule (2).

(9) The prescribed shooting fee for form 'A' is as under:—

Shooting fee	Rs. 50/-
Guest fee (Extragun)	Rs. 50/-

Three extragun friends are allowed in a shooting permit in form 'A' excluding the permit holder.

(10) Blocks reserved for Shikar Companies and V.I.Ps. shall be excluded from the draw.

(11) The Chief Wild Life Warden, U.P. has the right not to entertain any application for the draw, if in his opinion it is in the interest of wild life preservation to do so. No reason shall be assigned for not entertaining an application.

(12) If an applicant applies for a particular shooting block(s) and for any reason no draw is held for that (those) block(s) the application fee shall be refunded.

(13) Permit holders must possess licence for the fire arms required for the shoot. He is required to give details of arms to be used in the shooting block along with his shooting fee.

(14) Tigers will not be included in the bag limit allowed under shooting permit unless the applicant possesses rifles of .375 magnum, or 400 bore non-magnum and above, with at least 300 grains bullet weight and above.

(15) No permit holder is allowed to avail two shooting blocks in the same fortnight.

(16) Not more than two shooting blocks are allotted to a person in one shooting season through the procedure of draw.

(17) Applicants applying for more than two shooting blocks should give the names of the shooting blocks applied for in order of preference in which they would like to shoot, if allotted in the general draw.

(18) Shooting season is October 16th to 31st May following.

(19) Permit in form 'A' for big game shooting shall be issued for second fortnight of the month only.

(20) Military personnel will be allowed fifty percent concession in shooting fee and royalty.

(21) In the absence of the permit holder, his extragun friend will not be allowed to shoot.

(22) Warrantable sizes of the species are as under:

Chital	33"
Sambhur	32"
Hogdeer (Para)	12"
Tiger	8'
Tigress	7'
Panther	5'

(23) Royalty at the following rates will be charged from the permit holder on the species shot by him and his Guests:

		<i>From Indians</i>	<i>From Foreigners</i>
Tiger	Rs.	200.00 each	150 Dollars
Panther	Rs.	75.00 each	75 Dollars
Sambhur	Rs.	40.00 each	10 Dollars
Cheetal	Rs.	20.00 each	5 Dollars
Hogdeer	Rs.	15.00 each	5 Dollars
Kakar	Rs.	15.00 each	5 Dollars
Bear	Rs.	15.00 each	35 Dollars

(24) Foreigners coming to India on tourist visa can shoot through one of the recognised shikar outfitters.

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Answer Man

Question: Why is the 'nilghai' in the cow family? What looks like a cow in this animal?

Answer: It is not in the 'cow' family (Bovidae) but an antelope, *Bocelaphus tragocamelus*. It does not resemble the 'cow' at all except in its often misplaced trust in the human race. It is a large, awkward-looking equine antelope, with high withers and low rump. The horns are conical, distinctly keeled and triangular at the base.

Question: Do Roe deer shed their antlers, if so when?

Answer: The roe, unlike the Red Deer are shy, woodland creatures according to Fraser Darling's classic ungulate study...the roebuck leaves its small harem of a few hinds for a month or more. The antlers are shed every year and sometimes every two years, as in other cervine species, depending on diet. They are preserved in Scotland and parts of Europe.

Question: What is the Polyplectron?

Answer: *Polyplectron bicalcaratum* is the Peacock Pheasant found in parts of Assam. Though neither much sport nor really good eating, it is often snared and even shot. We ourselves have shot it for mounting in the Mikir and North Cachar hills. It has a beautiful tail which when spread out like the peacock's displays to advantage the characteristic spots.

Very little is known of its habits, as it is shy, generally sticking to one locality in coverts and parties, to scratch among dead leaves.

Question: How many tigers are there in India to-day?

Answer: Though no accurate census has been conducted, it is estimated at between 4,000 and 6,000.

Question: What is the best gun for shooting tiger?

Answer: The best weapon, we feel, is a camera, with a 85 mm to 250 mm. zoom lens. However, for young people wanting the thrill of their first tiger, a heavy .470 DBBL rifle is best. Anything over .375 (Magnum) is legal.

The Goral of Benog:

An Area-Specific Study of *Nemorhaedus goral*

By

HARI DANG

Introduction:

The Western or Grey Goral occurs from Kashmir and Chamba to Nepal. It is not proposed here to enter into the troubled systematics of the various races of goral or its sub-specific variations. We will accept that our goral is the *Nemorhaedus goral goral* (Hardwicke, 1825) with the restricted range of Kumoun and Punjab Himalaya.

The approximate distribution of the species as given by Ellerman and Morrison-Scott is from extreme south-eastern Siberia and the Alin mountains, through Manchuria, Korea, China excepting Kansu, Tibet, Burma, Assam, Punjab, Nepal and Kashmir. We ourselves have seen 2 races of goral, and F.M. Bailey, as lately as 1914 discovered and identified a new race, the *Nemorhaedus goral baileyi* from the banks of the Yigrong Tso near Dre in Po Me at 9,000 feet in Tibet, and the last word has not been uttered yet on its races.

This study, thus, will be restricted to the goral population of Benog, a popular and yet largely undisturbed hill near Mussoorie, to which I have been making trips for ten years, from 1958. Data collected are largely through personal observation, but numerous friends, shikaris and sportsmen and village-poachers have contributed. I would particularly like to mention Kr. Brijendra Singh, whom I introduced to this dainty goat-antelope, and who came to know more than his teacher about it; and to Bacchan Singh, a moustachioed villain in the classic village-poacher mould, who thinks and climbs like a goral.

I have included supplementary data from other areas where I have hunted and tried to photograph unsuccessfully and watched this animal, the cliffs near Dhanaulti, Nag Tibba, Pilti near Mansiari in Kumoun, the vast landslides of the Sukhi Nadi near Nandhaur in Naini Tal terai. In these areas are the favoured cliff-locations, forage and terrain of goral, and herds of decreasing numbers still occur.

The Mountain of Benog:

Six miles west of the quarry-scarred hill-station of Mussoorie, deforested by poor soil on the south slopes, is Benog, nearly 7,000 feet high above sea level. It is separated from the main Mussoorie east-west ridge by a col at 5,000 feet high, from either sides of which streams descend through tangled oak and rhododendron, boxwood and mixed ringal and tree thickets, to join the Jamuna by skirting the base of Benog.

The study-area is partially insulated from migrations by the ring of villages and cultivation which surrounds the mountain, except over the southern col. The population of goral

thus changes only in consequence of the known reduction caused by predation, human and feline. The increase, too, remains within the area, though there are two instances reported by Bacchan Singh when a herd of goral is known to have crossed over to the better insulated southern slopes of the Cloud-End to Mussoorie ridge.

Habitation is absent from this upper part of Benog, except for one hut infrequently occupied by gujars in winter. These offer little disturbance to the goral, who have been seen from the dismantled straw shelters on occasion. Villages are everywhere around it, below 4,500 feet.

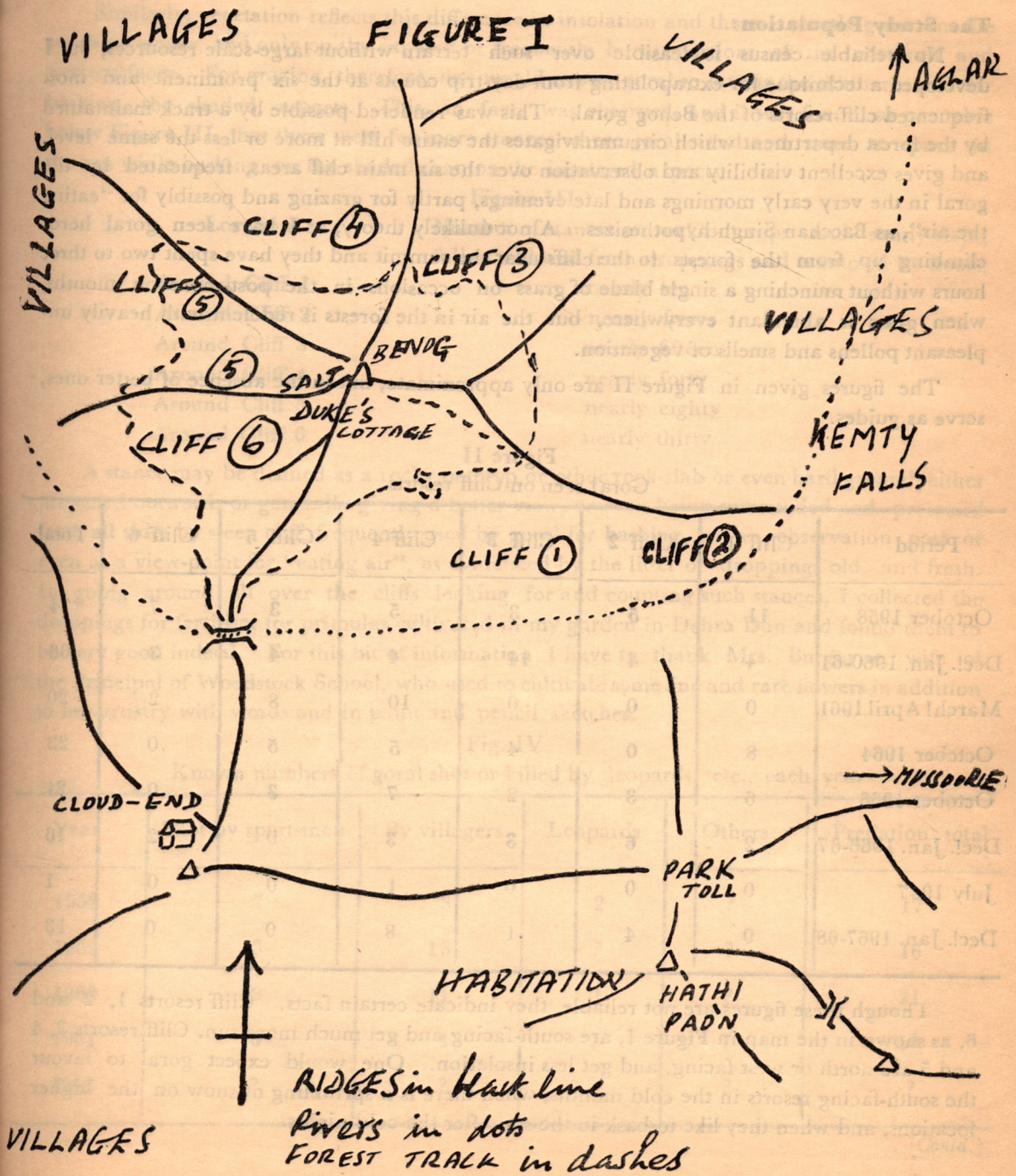
Vegetation:

Cliffs and scrub-oak, with mixed broad-leaf deciduous trees are the characteristic vegetation, with grasses of coarse kinds. Favoured locations grow the softer succulent grasses which find favour with goral in the winter months. Conspicuous and steep grassland country is everywhere in evidence on the southern slopes and on steeper ground on the north. Stands of blue pine and deodar near the summit, and stray chir pine trees elsewhere complete the pattern of vegetation. Ravines and nallas harbour bushes like *Berberis* and *Cotoneaster* and *Cotoneaster mycophylla* forms pads on rocks on exposed faces.

Limestone rock, often marble, underlies most of the mountain, appearing to the surface in rocky ribs and ridges, while frost-shattered and weathered fragments of limestone form screes, often covered with a thin layer of soil and grassy tussocks. Mosses and lichens flourish in colder and damper localities.

What lends special significance to Benog is the fact that an Englishman called Duke had a cottage on the crest of the western ridge of Benog in the days when Mussoorie was just founded, and had a deep well dug into the shingle and soil of the ridge. He used to pack this with winter snow and to use the well as a primitive form of deep-freeze for meats and foods and beer to serve custom in Mussoorie prior to the advent of refrigeration.

Cloud-End, again, is a cottage on the southward spur leading up from the col south of Benog, at a height of 7,000 feet, inhabited for almost a century by the Swetenham family, now in the possession of a resident of Dehra Dun. Duke had been using salt and nitre for attaining low temperatures in his deep freeze well, and it appears from the concentrations of goral always seen around the well and below it on the western cliffs, where the seepage from the well must flow, that years of salt has penetrated into the ground, and made salt the western cliffs, an accidentally man-made salt-lick. Since 1958 this salt was replenished to my knowledge by villagers in the monsoon months to ensure good shooting during their winter drives for Diwali, when numbers of goral and kakar were and still are shot. Figure I gives a rough idea of the mountain.



The Study Populations

No reliable census is feasible over such terrain without large-scale resources, but I developed a technique for extrapolating from day-trip counts at the six prominent and most frequented cliff-resorts of the Benog goral. This was rendered possible by a track maintained by the forest department which circumnavigates the entire hill at more or less the same level, and gives excellent visibility and observation over the six main cliff areas, frequented by the goral in the very early mornings and late evenings, partly for grazing and possibly for "eating the air", as Bacchan Singh hypothesizes. A not unlikely theory, as I have seen goral herds climbing up from the forests to the cliffs near the summit and they have spent two to three hours without munching a single blade of grass on occasions in the post-monsoon months, when grass is abundant everywhere, but the air in the forests is redolent with heavily unpleasant pollens and smells of vegetation.

The figures given in Figure II are only approximate, but in the absence of better ones, serve as guides.

Figure II
Goral seen on Cliff resorts.

Period	Cliff 1	Cliff 2	Cliff 3	Cliff 4	Cliff 5	Cliff 6	Total
October 1958	11	5	3	5	3	7	34
Dec! Jan. 1960-61	4	4	14	4	4	3	36
March! April 1961	0	0	0	10	8	2	20
October 1964	8	0	4	5	5	0	23
October 1966	6	3	2	7	3	0	21
Dec! Jan. 1966-67	2	6	3	3	0	2	16
July 1967	0	0	0	1	0	0	1
Dec! Jan. 1967-68	0	4	1	8	0	0	13

Though these figures are not reliable, they indicate certain facts. Cliff resorts 1, 2 and 6, as shown in the map in Figure I, are south-facing and get much more sun. Cliff resorts 3, 4 and 5 are north or west facing, and get less insolation. One would expect goral to favour the south-facing resorts in the cold months, when there is a sprinkling of snow on the higher locations, and when they like to bask in the sun after the cold nights.

Similarly, vegetation reflects this difference in insolation and there is mostly grass on the southern slopes, and only on the exposed or frequently burnt portions of the northern and western faces. For grazing, therefore, one would expect goral to favour the southern, and for basking, the shaded, aspects. This, in fact, was observed, and it was found, as per table below Figure III, that there were far more stances where goral stand and stare at space in the sun while basking, on the shaded than on the insulated aspects.

Figure III

Location	Number of stances on rock-outcrops and sunny-slabs, full of old and fresh droppings and trampled by hoofs.
Around Cliff 1	nearly ten
Around Cliff 2	nearly five
Around Cliff 3	nearly fifteen
Around Cliff 4	nearly forty
Around Cliff 5	nearly eighty
Around Cliff 6	nearly thirty

A stance may be defined as a rocky outcrop or other rock-slab or even hard ground, either projected outwards or generally giving a better view, or even being surrounded and protected from all sides by steep cliff, frequently used by goral for basking, as an observation post or even as a view-point for "eating air", as evidenced by the litter of droppings old and fresh. In going around all over the cliffs looking for and counting such stances, I collected the droppings for fertiliser for primulas cultivated in my garden in Dehra Dun and found them to be very good indeed. For this bit of information I have to thank Mrs. Burgoyne, wife of the Principal of Woodstock School, who used to cultivate some fine and rare flowers in addition to her artistry with words and in paint and pencil sketches.

Fig. IV

Known numbers of goral shot or killed by leopards, etc., each year

Year	Shot by sportsmen	By villagers	Leopards	Others	Predation total
1958	7	8	2	?	17
1959	3	13	?	?	16
1960	9	11	1	?	21
1961	6	4	?	?	10
1962	?	?	?	?	?

(Contd.)

Year	Shot by sportsmen	By villagers	Leopards	Others	Predation total
1963	?	?	?	?	?
1964	5	17	3	?	25
1965	12	4	2	?	18
1966	9	10	1	?	20
1967	5	4	?	?	9
1968	4 so ar	9 so far	1	?	14

N.B.: Information supplied by sportsmen and shikaris is included.

Figure V

Table of some of the most common vegetation of Benog with locations

<i>Pinus longifolia</i> (roxburghii)	Chir pine	En and SEn slopes, mixed with oak and scrub
<i>Pinus excelsa</i> (wallichiana)	Kail or blue pine	Stand near summit with deodar
<i>Cedrus deodara</i>	Deodar	Stand near the summit on Nn and NEn aspects
<i>Quercus incana</i>	Banj or white leaf oak	All over
<i>Rhododendron arboreum</i>	Burans	Individual trees in ravines and on hill sides
<i>Picris ovalifolia</i>	Ayar	In oak and rhododendron thickets.
<i>Aesculens indica</i>	Horse-chestnut or Bankhor	In ravines S & W of Benog

Figure 5
Grasses and other shrubs and timbers

Botanical name	Hindi/Local name	Location	Fruits/Occhs	Whether escaped or eaten by goral
<i>Eriophorum comosum</i>	hedges or grassy shrub	Widespread on Nn & Wn aspects	?	?
<i>Arundinaria falcata</i> <i>Arundinaria spathiflora</i> <i>Arundinaria jannasensis</i>	Ringal or dwarf bamboos	Gregarious in moister localities	Edible tender shoots in May, June & July	Eaten
<i>Coix lachryma-Jobi</i>	Sanksn	Lower Nwn aspects	Edible seed	?
<i>Cymbopogon nardus</i>	aromatic like rosha grass or C. martinii	Lower Nwn aspects	Aromatic	?
<i>Anthisteria gigantia</i>	Kumsia	—	Dark brown hairy, spiny seed which gets into clothes	?
<i>Raphidophora glauca</i>	?	A tall succent stemmed climber common on Nn & NEn aspects	?	?
<i>Asparagus filicirias</i>	Kamta	In ravines & shady aspects	—	Roots and shoots eaten
<i>Cotoneaster bacillaris</i>	Ruinsh	Shrubs in nallahs	?	?
<i>Cotoneaster mycophylla</i>	Bhedda	Spreading, trailing pads on grass	?	?
<i>Thymus serphyllum</i>	Ajwain	Everywhere	—	Leaf eaten
<i>Cinnamomum tamala</i>	Dalchini	In nalas	—	Leaf eaten

(Contd.)

Botanical name	Hindi/Local name	Location	Fruit/Occhs	Whether escaped or eaten by goral
<i>Piper brachystachium</i>	Pahari pipar	In high shady nalas	—	Leaf eaten
<i>Plectranthus rugosus</i>	—	Everycolne	—	?
<i>Elsholtzia polystachia</i>	Pathoi	Common with indigoferas on open grassy slopes	—	?
<i>Mentha viridis</i> (+ <i>piperita</i>)	Pudina	Valley and ravine bottoms as 'escapes'	—	Leaf eaten
<i>Jasminum</i> (several Sub species)	Chameli	Ravines and hill sides	—	?
<i>Prunus</i> (Crasoides) (+ others)	Padam or Jamoi	Ravines	—	Fruit eaten
<i>Ilex dipyrina</i> (+ <i>odorata</i> and <i>oloniana</i>)	Kander and Tubri	Ravines	—	?
<i>Rubus</i> (<i>Paniculatus</i> and <i>Niveus</i> and <i>Fasciculatus</i>)	Bramblus (Pandroi, bhesa, ell)	Trailing shrubs along ravines	—	?
<i>Rosa</i> (<i>macrophylla</i> and <i>sericea</i> and <i>moschata</i> etc.)	Wild briars, Bhainsa Kunjoile	Ravines	—	fruit of biflorus is eaten
<i>Carrisa opaca</i>	Kasmanda or boxwood	Everywhere ravines	—	Fruit may be eaten fruit eaten

If we accept the Figures in II and IV as rough working hypotheses, we get the impression that though reproduction is possibly keeping pace with mortality through predation, there is an observable reduction in the population of goral on Benog. Now, all our figures are

doubtless somewhat arbitrary, but there is such a marked diminution in the numbers seen from 1958 to 1968, that the above conclusion is inescapable.

Breeding behaviour of goral has not been recorded, despite the fact that it is one of the best known of Himalayan animals, being found so near hill-stations.

On Benog, fawns, distinguishable from distances of two hundred yards, which means they must not be more than three months old after which it becomes hard to distinguish between mature and young, have generally been seen in the months of June, July and August and less frequently in September and October. At this time the adult males and females are lighter in shade, and the fawns if anything darker, though the black dorsal strips, the black tail, and the clear white throat patch are diagnostic of adults.

The mating evidently takes place in the late winter months, though lacking detailed studies of gestation periods one has to fall back upon the known periods for goats and sheep which vary between three and five months.

Twice, I have seen goral indulging in pre-copulatory and actual mating behaviour, both times not on their favoured cliff resorts, but on grassy slopes below the cliffs. The herd of seven on one occasion watched the display unconcerned. Another time only two bucks and a doe were present, and the younger buck, immature perhaps, stood some two hundred yards away, occasionally emitting the characteristic hissing whistle of goral, and looking on, but not moving in closer.

The horns being insignificant, and present in both sexes, though the male's horns are thicker and longer, it is hard to form any idea of the age and sex composition of the population. More bucks are shot than does, but that may be because bucks are prized as trophies, or that they seldom take cover as quickly as does, being more curious or staying on longer in full view to give the does and young ones time to take cover.

Daily Activity Patterns:

Every morning the cliffs and nalas echo to the whistles and the clatter of hoofs of goral as they climb up from their night shelter in the thickets of vegetation in the ravines. In the evenings, the same process is repeated, unless the weather is cloudy or snow lies thick on the ground, in which case they may stay on the whole day on the cliffs if there is no human or feline disturbance.

Judging from the habitat of the goral below Dhanaulti in a canyon full of limestone caverns where the largest number of goral live permanently, it seems that even the Benog population spend their nights and sunny, disturbed days in the depths of ravines choked with vegetation. This seems to be a change from their normal behaviour pattern, as they are recorded as being cliff-dwellers in sporting literature. Now, it seems, they only visit the cliffs of Benog either for the salt or the browse available only on steep grass and cliff.

Figure VI

Supplementary observations from locations other than Benog

Location	Period/ season	Aspect	Altitude	Numbers	Fawns seen	Terrain	Vegetation
Dhanaulti	December	En	7000' A.S.L.	5	Nil	Cliff and steep slopes	Grass and shrubs
	March December	En Sn	4000' A.S.L.	8 17 (2 herds)	Nil 2	Deep canyon with grassy cliffs above	Mixed forest and grass slopes
Nag Tibba	October	Nn	6000' A.S.L.	4 & 3	4	Grassy cliffs	Pine and Oak forest
	March	Sn	8000' A.S.L.	18	Nil	Grassy cliffs	Fir and Blue pine
	October	Sn	8000' "	5	2	Grass and cliff	forest Grass only
Pilti Gad (Kumoun)	November	En	7000' "	8	Nil	"	Oak and Pine
	February	En	6500' "	7 & 6	Nil	Steep cliff	Oak and Pine
	May June	SEn SEn	9000' " 8500' "	4 & 13 28 (Spread out)	Nil & 3 7	Grass slopes Grass slopes	Grass only Grass only
Sukhi Nadi (Nandhaur)	October	Sn	5500' "	33 (Spread out)	Possibly 20	Landslide	Grass slopes
	December May	Sn Nn	3500' " 6000' "	8 & 7 3 & 5 & 11	Nil Nil	Steep " Steep "	" " " "

Breeding Behaviour:

The only case of observed mating was on cliff resort 5 of Benog, when I saw two such displays on two successive days in the month of April. There was little preamble to the mounting of the doe by a magnificent buck which I had seen on several earlier occasions, except for some butting to get the doe on to a level grass slope.

Since fawns are seen more in autumn than at other times, it would seem they are dropped sometime during the late monsoon period. Breeding thus takes place in spring, but on this subject much more and widely spread information is needed. According to Bacchan Singh, fawns may be seen at all times, except during the monsoon, but that may be because of the heavy cover then abundant.

In spite of increasing disturbance by grass-cutters who roam Benog from September on, when a contract is sold by the authorities, the goral are not leaving Benog, and despite Bacchan Singh and his ilk, who do considerable damage, the population seems to be holding its own. There are generally several parties of tourists who visit this view-point from Mussoorie, especially on Sunday, when the National Academy of Administration's students come up to spend the day. There is a good case for declaring this hill a sanctuary. But before doing so, arrangements must be made for posting a guard who will agree to LIVE on the location. Otherwise, villagers will continue to shoot.

Diet and Feeding Habits:

As mentioned earlier, more detailed studies are needed. The list of plants and grasses eaten, or fruits favoured cannot be drawn up without long spells of constant observation. It seems clear that "air" and security are not the only attractions of cliffs for goral. There must be some edible grasses and plants, as shown in Figure VI, Page 56.

Browsing is most common early in the mornings before the sun hits the slopes, and late in the evenings, before dark; on moonlit nights it may continue after dark.

Annual Movements:

These seem to be controlled by insolation and temperature, which in turn might be controlling plant life. It is hard to declare what is the real factor. On other locations, like Sukhi Nadi and Pilti, Nag Tibba and Dhanaulti, such migrations from lower to higher altitudes are less observable. In the Pilti nala; in the cliffs near Aghora below Dodi Tal and in the landslides of the Sukhi Nadi, I have seen more or less the same herds in the same locations during successive seasons and years, but some altitudinal movement is apparent even there.

Predation and Animal Inter-actions:

Villagers from the habitations all around Benog take regular toll of the goral with matchlocks, muzzle-loaders, etc., and organise beats during all major festivals, like Holi and Diwali. Professional poachers, who often work as timber-cutters and limestone and road-workers the rest of the time, occasionally shoot and sell the meat of goral and kakar in Mussoorie.

Panthers are numerous on Benog, and at least three pairs were known to be operating in 1966 and 1967. They are the commonest animal predators of goral, and between us, Bacchan, Brijendra Singh and I have seen three fresh goral kills, but only once was the predating panther shot. They seem to work the Benog hill in partnership, sending the goral herds to each other, while they lie in wait. The visiting goat and sheep herds also provide some prey to these panthers, and cows are also killed, though this latter near habitations.

Kakar often graze and browse within sight of goral on the cliffs 5 and 6, 3 and 4, where cover is favourable for them. Their feeding habits are less diurnal, as they feed throughout the day.

When panther are around, the goral are more alert, and sneeze and whistle to each other more frequently. In fact, by the behaviour of goral, it is possible to know of the feline presence, because their reaction to human beings, unfortunately for them, is not immediately alarming. They are curious like all goats and will linger to confirm whether the men are grass-cutters or hunters, often till it is too late.

Snow, which falls between November and March on Benog, often down to the forest level near the ravines, is between three and twenty inches, and when heavy snowfall has occurred, goral will either move down, or spend their day in sunny glades or cliffs like 1 and 2, which receive maximum warmth.

Wildcats abound all over Benog, presumably preying off pheasants and young of goral and kakar. The eggs of pheasant must be the worst sufferers. Pheasants are common, especially the Cheer, Koklass and Kalij, while Tragopan may be found on the Northern aspects, but this is not confirmed.

There is occasional news of a serow in the ravines south and west of Benog, but only one was shot by villagers in the last ten years, and that a small female.

Conclusion:

In conclusion, it seems the goral are keeping pace with predation, but they may not be able to continue to do so, and Benog hill should be made into a sanctuary, properly supervised by a Game Warden. Scientifically managed, it could well become an added attraction to the rather sedate hill-station of Mussoorie.

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प्रकृति और मानव

हरीप्रकाश अग्रवाल

मानव की उत्पत्ति के समय से प्रकृति के साथ उसका सम्बन्ध अविरल गति से चला आ रहा है, क्योंकि मानव स्वयं प्रकृति का एक अंग है। प्रकृति की देन मानव-जीवन के लिए एक अमूल्य निधि है। यह चरम सत्य है कि किसी भी वस्तु के उपयोग या दुरुपयोग, लाभ या हानि के लिए मानव स्वयं ही उत्तरदायी है। प्रकृति में कोई भी वस्तु बुरी या हानिकारक नहीं है।

पक्षी हमारे जीवन के आधार हैं। ये हमारी फसलों की विविध प्रकार के घातक कीड़े-मकोड़ों से रक्षा करते हैं। मनोरंजन के लिए पक्षियों का प्रमुख स्थान है। प्रभात और संध्या के समय उनका कलरव कितना मनमोहक लगता है।

मनोरंजन करने के साथ-साथ ये भ्रमणकारी पक्षी कुशल हवावाज होते हैं, उन्हें अपना गन्तव्य स्थान खोजने में देर नहीं लगती। प्राचीन काल में और अब भी कबूतरों से पत्र-वाहक का कार्य लिया जाता है। ये पक्षी अपनी मंजिल का अनुमान सूर्य की दिशा से लगाते हैं। सूर्य की एक किरण भी उन्हें दिशा बोध कराने के लिए पर्याप्त होती है। रात्रि के समय उन्हें जगमग सितारों से सकेत मिलते रहते हैं। ये पक्षी एक प्रकार के रडार हैं जो वांछित स्थल का सही ज्ञान प्राप्त करने में भूल नहीं करते। प्राचीन काल में पक्षियों के उड़ने, आकाश में बहुत ऊँचा मंडराने आदि से आंधी, तूफान या युद्ध-स्थल की वीभत्सता आदि के विषय में जान लिया जाता था। समुद्र में भटके जलपोत के नाविकों को दिखाई पड़ जाने वाले पक्षी इस बात की आशा दिलाते थे कि आसपास कहीं स्थल अवश्य है।

भारत में अनेकों जंगली जन्तु हैं जो आर्थिक दृष्टि से बहुत महत्वपूर्ण हैं। जानवरों के बाल, गोश्त, चर्बी, सींग, हड्डियाँ, हाथी के दाँत और पक्षियों के पंखों द्वारा बहुत आर्थिक लाभ होता है। औषधि के क्षेत्र में जो कुछ भी कहा जाय कम है। बहुत से पशु-पक्षियों का मांस व तेल अनेक प्रकार के दर्द या पीड़ा के लिए विशेष गुणकारी कहे जाते हैं। घोंघे व केंचुओं का मांस क्षय रोग के लिए बहुत लाभप्रद है। सर्प जो बहुत ही भयानक जन्तु है, उसके विष द्वारा ही anti-venom तैयार होता है। चेचक के टीके आदि की औषधि गाय के थनों से प्राप्त होती है।

प्रकृति में जितने जीव-जन्तु हैं, उनका अपना अलग-अलग महत्त्व व स्थान है। बोनियों में सूअर के उद्दन्त सजावट के काम आते हैं। स्याम और चीन में इनसे कंगन बनाये जाते हैं, मलय में कुछ डकैत उद्दन्त इस विश्वास से पहनते हैं कि वह उन्हें मुसीबत में फंसे से बचाता है। प्राचीन काल में राजा जंगली जानवरों को पालने का बहुत शौक रखते थे और उनका प्रदर्शन करते थे। अकबर के पास सैंकड़ों चीते थे। आज भी ऊँट आवागमन का एक अच्छा साधन है। बर्फीले प्रदेशों में रेंडियर और याक इत्यादि जानवर भी गाड़ी खींचने के काम में लाये जाते हैं। आस्ट्रेलिया के आदिवासी मांस के लिए कंगारू का शिकार करते थे, इसकी खाल से

जूते आदि बनाये जाते हैं। मूंगा, मोती समुद्र में बनते हैं और समुद्री पानी में रहने वाले जीव ही इन्हें बनाते हैं। मूंगा बनाने वाला जन्तु भूमध्य रेखा के २८ अंश उत्तर तथा २८ अंश दक्षिण अक्षांश के बीच के देशों में होता है। ये अधिकांशतः १० से ५० फीट तक गहराई पर होते हैं, परन्तु १५० फीट से अधिक की गहराई पर नहीं पाये जाते। मधुमक्खी व रेशम के कीड़े की उपयोगिता भी किसी से निहित नहीं है। कछुआ भी एक छोटा प्राणी है, उसके ऊपर की त्वचा बहुत ही मोटी व कड़ी होती है जिसके द्वारा चर्मों के फ्रेम भी बनते हैं। बहुत से मनुष्य इसका मांस भी खाते हैं। ये कछुये कीड़े-मकोड़ों का भी विनाश करते हैं और प्रत्येक सम्भव प्रयत्न से मानव जाति को लाभ पहुँचाते हैं।

यद्यपि यह सत्य है कि विषालु सर्प मानव-जीवन के लिए घातक हैं और उनके काटने से मृत्यु की संभावनायें रहती हैं किन्तु साथ ही ये समाज का बहुत भला भी करते हैं। ये कृषि के शत्रुओं जैसे चूहे, खरगोश, गिलहरी आदि को खा जाते हैं और उनसे होने वाली फसलों के नुकसान को बचाने में बहुत सहायता करते हैं। चूहों से होने वाली बीमारियों पर उन्हें नष्ट करके नियन्त्रण रखते हैं और इस प्रकार ये सर्प अत्यन्त भयंकर होने पर भी मानव के बहुत बड़े सहायक हैं।

प्रकृति ने मानव को इतनी समझ व बुद्धि दी है कि जो हानिकारक वस्तु है उसका भी उपयोग कर सके। मनुष्य चूहे, खरगोश आदि जन्तुओं को अपने वैज्ञानिक अनुसंधान के काम में लाता है। जो प्रयोग मानव पर नहीं किया जा सकता वह प्रयोग इन्हीं जन्तुओं पर किया जाता है और इस प्रकार ये छोटे प्राणी भी विज्ञान की उन्नति में सहयोग देते हैं। सैकड़ों चूहे, खरगोश आदि मानव के द्वारा मानव की भलाई के लिए ही संहार किये जाते हैं।

जीव-जन्तु धार्मिक महत्त्व भी बहुत रखते हैं। सुअर को संस्कृत में वराह कहते हैं। यह कहा जाता है कि पृथ्वी का उद्धार करने के लिये इसे अवतारित किया गया था, इसलिये इसे अवतार की संज्ञा दी गई है। सुअर के रूप में विष्णु की शक्ति को बाराही कहते हैं। भारतीय देवताओं के वाहन भी विस्मयकारी हैं—शंकर के ही परिवार में विविधता है—बैल से लेकर चूहे तक विद्यमान हैं। विष्णु परिवार में पक्षियों का प्रवेश है—विष्णु की सवारी गरुड़ है तो लक्ष्मी की उत्सू। हंसों का वर्णन सरस्वती की सवारी के रूप में शास्त्रों में विदित है। सूर्य के रथ में घोड़े तो चन्द्र रथ में हरिण हैं। भारत में अश्व-रथ का प्रचलन पुराना है। चीते के चमड़े से मढ़ा रथ “द्वैप” और व्याघ्र-चर्म से मढ़ा रथ “वैयाघ्र” कहलाता था। वैदिक युग में वैमाघ्र रथों का प्रयोग राज्याभिषेक के अवसर पर काम आता था। बन्दर, लंगूर का भी रामकथा में सुन्दर वर्णन आता है। शास्त्रों द्वारा यह भी ज्ञात होता है कि भगवान ने दुष्टों का संहार करने के लिये कछुये का रूप धारण किया। मनुष्य सर्प आदि को मारना पाप समझते हैं और भारत में तो इनकी पूजा भी की जाती है। नाग या सर्प देवता भी माने जाते हैं। शेषनाग को तो विष्णु की शैय्या समझा जाता है जिस पर वे शयन करते हैं। भारत में इसे धर्म रहस्यवाद, लोककथाओं, तेज तथा सभ्यता का प्रतीक माना गया है। सर्प ही नहीं कुछ अन्य पशुओं को भी पूजने की प्राचीन परम्परा है जैसे गाय आदि।

प्रकृति हर प्रकार से मानव की उन्नति में योग देती है। नदी, नाले, पर्वत, वन, वृक्ष सभी कुछ तो मानव की सहायता करते हैं। बड़े जीव-जन्तु ही नहीं, छोटे-छोटे कीटाणु भी मानव-जीवन के लिए अत्यन्त

उपयोगी हैं। हमारा परम कर्तव्य है कि प्रकृति की प्रत्येक देन को व पशु-पक्षियों को प्राकृतिक वातावरण में विचरण करने दें तथा इनकी सुरक्षा का पूरा ध्यान रखे। यदि हम ऐसा नहीं करेंगे तो इन सुन्दर पशु-पक्षियों की बहुत सी जातियाँ लुप्त हो जायेंगी। इनकी सुरक्षा के विचार से ही भारत में तीन सौ ईसवी पूर्व रचित “अर्थशास्त्र” में चाणक्य ने “अभयारण्य” का विधान रखा था जहाँ पशु-पक्षी बिना मनुष्य के भय के विचरण कर सकें।

प्रकृति का मानव से वैसा ही सम्बन्ध है जैसा आत्मा का शरीर से। मानव खुले वातावरण में प्रकृति की काँड़ में जितना सुख, उल्लास, उमंग व स्फूर्ति अनुभव करता है वह कभी प्रकृति के अभाव में इतना वैभवशाली नहीं बन सकता था। प्रकृति की गोद में आज भी कितनी अमूल्य वस्तुयें छिपी हुई हैं, कौन बता सकता है? किन्तु, मानव भी तत्परता से उसकी खोज में व्यस्त है और एक समय आयेगा जब प्रकृति की कोई वस्तु मानव से दूर अंधेरे पर्दों में नहीं रहेगी। प्रकृति जीव-जन्तुओं, वृक्षों इत्यादि अनेक रूपों से मानव की उन्नति को सर्वोच्च शिखर पर पहुँचाती रहेगी।

The Trapped Tiger of the Doon Shiwaliks

So much has been made in the press of this incident that we feel it desirable to give the facts, especially in their relevance to conservation of the tiger population of India. The Wild Life Warden of Dehra Dun, Sri R.S. Bhadauria, who is dealing with this case, is preparing a fuller report on all his findings, and on the results of his attempt to use tranquilliser in his determination to save the tiger and to show the villagers, who are generally responsible for setting traps, that the Wild Life Organisation is determined to save wild life, in spite of the methods and tricks used for its destruction. We will be publishing his fuller report in the next issue of CHEETAL.

A mature, male tiger was found caught in a steel trap in the Kaluwala Shooting Block in Shiwalik Forest Division, and duly reported to the Warden by the sportsman, whose shikari had first seen this, attracted by the growls of the animal. Both shikari and sportsman deserve credit for following the rules of legitimate shikar, and we are glad that the sportsman was a member of the Wild Life Society.

The Wild Life Warden immediately took steps to procure tranquilliser equipment, the so-called ‘Capchur’ gun first marketed by Palmer Equipments of America. On the 22nd of October, after some delay in obtaining this equipment from the Chief Wild Life Warden in Lucknow, the Warden, along with his staff, the Veterinary Surgeon, Dr. Arora, of the Deptt. of Animal Husbandry, and a local sportsman, approached the tiger in the trap on elephant-

back. Two syringes charged with 3 mg.-of-nicotine (standardised alkaloidal nicotine) per kg body weight, on a body-weight calculation of 500 lbs., were fired from a range of about 15 metres. The first one, according to the Warden, missed due to the elephant's movements, but the second one hit the tiger at the correct location on the hip, and discharged its contents.

The moment the drug, which initially acts as a stimulant and renders the body insensitive to pain before completely immobilising the animal, became active in the circulatory system, the tiger, in excitement, managed to pull out its trapped paw, and after making a fient at the elephant, escaped into the forest. The tiger was seen running by the Warden's party, "using all its four feet equally well, giving no sign of limp". According to the Warden, he then "searched the trap area, and the trap left behind, which also confirmed that no portion of the trapped part got amputated. Of course, minor abrasions can not be ruled out".

Three weeks have elapsed since this incident, and no news of human kills has come, so the tiger may be deemed to have reverted to normal. The Warden and his staff are keeping track of this tiger which, they report, they have "seen twice since then".

Only Thomas in 1961 has given figures for the use of tranquilliser drugs on tiger, probably in captivity, and he was using succinyl choline chloride at between .75 to .92 mg/kg body-weight, but this drug is more potent than nicotine.

It would have been even more interesting from the academic point-of-view if the tiger had become immobilised and had not released itself in the convulsions and excitation which are the immediate, short-term effect of nicotine injection. Dr. Arora would then have administered medical aid to the sedated tiger, if at all it was needed, before releasing it.

In any case, the 'Cap-Chur' gun purchased at much expense by the Wild Life Organisation, U.P., has been used for the first time in such a case. Much more work should be done on techniques of tranquillisation, as very little of it has been done in India so far. In this respect, this is a pioneer attempt, and we will look forward to receiving the full report, which should encourage further work in this field.

—Contributed.

A Plant (*Eremostachys superba* Royle) In Danger of Extinction

by

SOM DEVA

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Situated on the South of Dehradun valley in the Siwalik is a large, extensive rugged mountainous territory which has been reserved as Rajaji Sanctuary. Several laws and restrictions have been imposed which are enforced by vigilant game wardens to protect the animal wealth of this area. This particular tract is also very rich in plant wealth, and due to its peculiar geological and soil types several plants which were once a part of very extensive flora also find protection in this region. Unfortunately it is not well realised that to provide a complete sanctuary to the animal species it is necessary that the natural vegetational cover should also be protected. The annual fires created for scientific forest exploitation and annual extraction of trees and especially grasses for ropes and paper industry are gradually changing the complex of the vegetation. The author wants to draw attention especially to one such plant *Eremostachys superba* Royle, which is very beautiful flowering plant of family Labiatae. It is in complete danger of extinction. The Tajmahal can be recreated several times but once a species is lost it can never be recreated. This plant, as the records at the Herbarium of the Forest Research Institute, Dehradun and that of the Botanical Survey of India (Northern Circle) Dehradun show, was last collected in 1879 by J.F. Duthi and since then no collection has been made.

It was first discovered and described from Siwaliks near about the year 1925 by J.F. Royle (1839), Superintendent of the Botanic Garden, Saharanpur. He writes "..... this very showy and elegant plant I have only met within the Khree pass or entrance from the direct road from Saharanpore in to Deyra Doon. Introduced in to Botanic Garden it became perfectly naturalized and highly ornamental". G. King (1882) Superintendent of Saharanpur Botanic Garden for a short time and later Superintendent of the Royal Botanic Garden Calcutta notes ".....one labiatae plant (*Eremostachys superba*) is confined to one or two spots in Siwalik and is one of the best examples known to me in India of a truly local plant". J.F. Duthi also calls it ".....extremely local and very handsome plant". It is clear from the above statements that the most beautiful plant which nature has given us should be protected at all cost.

To locate the area where this plant is situated in Siwalik the author systematically started exploring different tracts and finally after three years he was able to locate a small population of about twenty or so plants in a secluded spot. In this area also

due to excessive grazing and cutting of grass, generally the tip of the plant is cut and thus they are not able to flower. Moreover of few of these which remain, the fruiting spike is destroyed by the artificially created forest fires. The result is that the plant is unable to flower and fruit, and is in danger of extinction.

The author suggests that full protection should be provided to this plant and the following precaution should be observed.

1. The area where the plant is found should be protected by barbed wire against grazing and forest fires.
2. When the population has grown, the seed should be collected and distributed to different Botanical Gardens and forest nurseries.
3. When the seeds are available in large amount, they should be sown in similar spots at different locations in Siwalik.

It is hoped that our natural heritage will be provided full protection and those who are concerned should take care now before it is too late. It is guaranteed that if approached by proper authorities, the author will take them to the particular spot, so that necessary arrangements for protection and regeneration can be made.

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Govind Pashu Vihar

A PRELIMINARY ECOLOGICAL SURVEY OF HAR-KI-DUN AND ADJACENT VALLEYS, WITH SPECIAL REFERENCE TO BHARAL AND RED (BROWN) BEAR

By

HARI DANG

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Introduction

The Tons river joins the Yamuna below Kalsi, in the valley of Dehra Dun below the foothills of the Himalayas, above the Shiwalik hills. A stone's throw distant, the Ashokan rock edict proclaims "Here not a single living creature should be slaughtered and sacrificed". A fitting start to the journey to the Upper Tons basin, which drains the waters melted by the glaciers of Bandarpunch in the Ruishar valley, Yamaduar (Jemdar) in the Har-ki-Dun valley, and the neve from the Borasu Pass.

Though the Tons basin might be considered to include the waters of the Supin and the Rupin rivers, and in fact the entire Supin range has been declared a sanctuary, this study will be restricted to the former three river basins, all above 8000 feet high.

I had visited this upper basin in 1953 and again in 1954 for sport and for climbing the Black Peak, and it was with even greater enthusiasm that a decade later this summer in May, we planned a trip with the purpose of making a wildlife survey; estimates of the animal populations if possible, and climbing the unclimbed Swargarohini, or Black Peak.

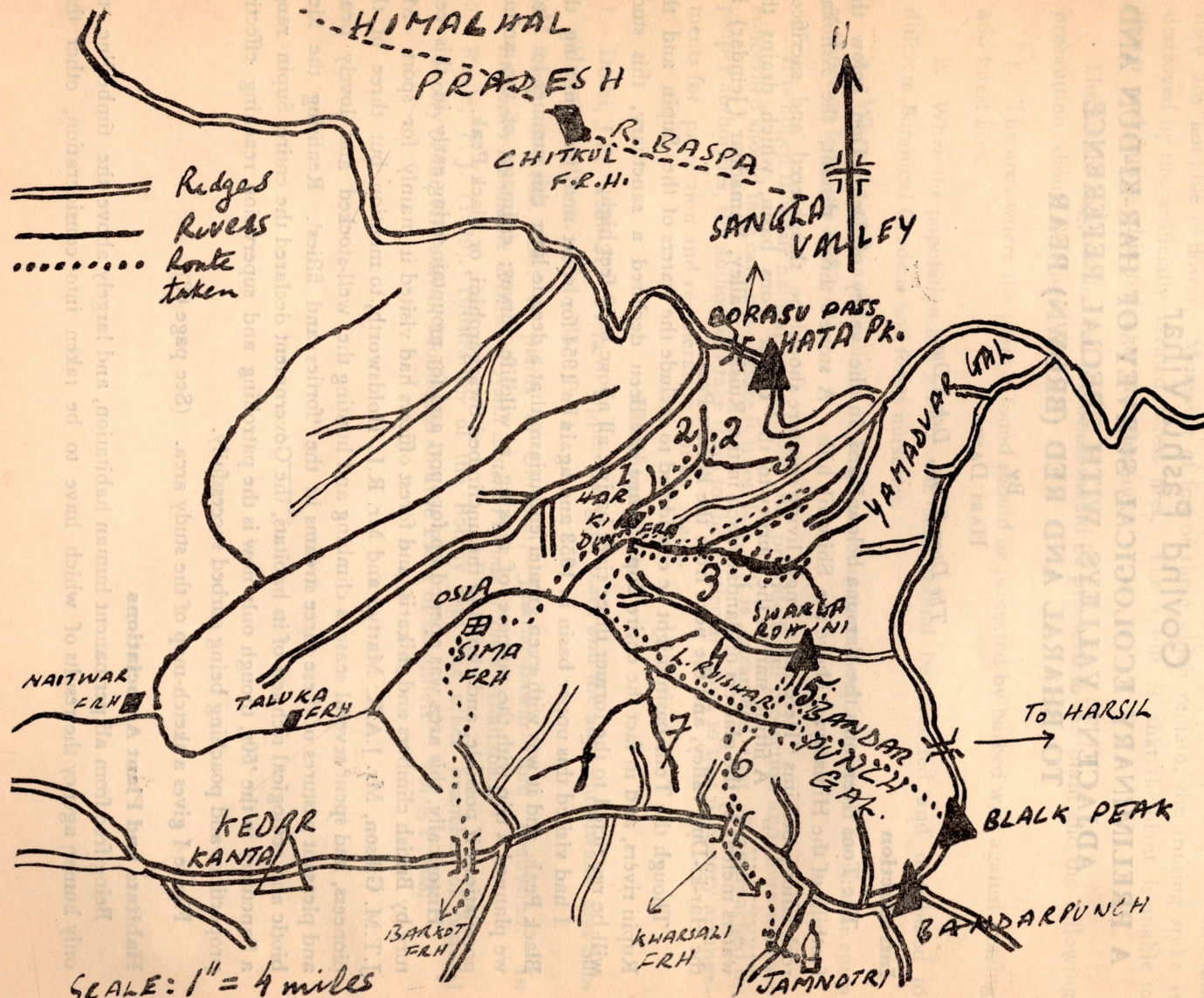
Historically, this area was opened up for sport and for mountaineering early in this century by British climbers and shikaris, and forest officers had visited it mainly for sport. Mr. J.T.M. Gibson, Mr. J.A.K. Martyn and Mr. R.L. Holdsworth, to mention but three of the pioneers, had spent several seasons climbing and hunting the well-stocked and lovely peaks and pleasant pastures of these three streams in the 'forties and fifties'. Realising the ideal biotic and ecological richness of its habitats, the Government declared the entire Supin range a Sanctuary in the '50s, though only now is the patrolling and supervision reaching effective proportions and poaching being curbed successfully.

Figure I gives a sketch-map of the study area. (See page 66).

Habitats and Plant Associations

Being free from all permanent human habitation, and largely above the timberline, the only human agency the results of which have to be taken into consideration, other than

Figure 1



parties of village poachers who visit the Sanctuary area, are the nomadic 'gujars' who camp at several alpine pastures during the brief summer months from May to September, inclusive, and the equally temporary shepherds who bring their flocks to graze the lush grasses in June, July, August, September and October.

The area can be divided into the following ecological types or zones of vegetation following the vertical zonation common to the Himalayas due to altitude and the consequences of aspect and isolation.

(Please see appendix on flora, by Sri K.C. Sahni, F.R.I.)

1. Woodland Habitats

- (a) Mixed broad-leaf, evergreen and deciduous forest of larch, maple, Horse Chestnut, etc., together with stands of deodar and blue pine, is found in sheltered and warmer localities around the junction of the Tons (Ruishar) and the Yamaduar (Jemdar) rivers above Osla village.
- (b) Black Taiga or Fir and Spruce, with deodar, blue pine occurs along hillsides till about ten thousand feet and in sheltered and favoured localities thereafter.
- (c) The White Taiga of Silver Birch and Rhododendron is the highest belt of tree-forest, the classic timberline habitat of the temperate zone.
- (d) A narrow, fluctuating belt of Dwarf Rhododendrons, Cotoneaster, Berberis and mixed scrub is found above the White Taiga, and often also lower down in burnt, over-grazed or erratic localities.

2. The Tundra Zone

Above the Timberline is the classic Juniper and Dwarf Rhododendron belt, often no more than a few yards, sometimes, as on the northern flanks of the southern ridge of Ruishar valley, it may extend for a thousand feet or more, even above grasslands, merging into the permanent snow-line. These aberrations seem to be undergoing the process of ecological plant succession, possibly through the agency of burning of grasses or over-grazing by goats and sheep.

3. Alpine Zone

Temperate Grassland: The ideal temperate Himalayan habitat of the herbivorous niche occupied by ibex, bharal, musk deer, argali, snow cock, etc., and by their associated predator the snow leopard, as well as by the red bear, in their respective ranges.

This grassland habitat has the best observability and fades on the higher altitudes into the shifting and permanent snow-lines, and along the lower margins into the Dwarf Rhododendron and Juniper belt.

4. The Arctic Zone

Patchy snow, scree and mosses and lichens.

Study Methods

Owing to restrictions of time at our disposal, the seven study locations which were observed over a length of time are numbered in Figure I, and the remaining habitats were studied only in passing. The results obtained, therefore, represented in Figure III, refer mainly to these 7 locations, all of which lie in the grassland and scrub zone, where clear visibility over great distances permitted continued observation. The species thus observed are consequently limited to the herbivorous niche above mentioned, together with the snow leopard and the red bear. The snow leopard is a fugitive from man, and is seldom seen, and has already been dealt with in 'The Snow Leopard and its Prey', CHEETAL, October, 1967, Vol. 10, Number 1. The Musk Deer has become very rare in the Har-Ki-Dun and was seen only twice in this one-month survey, partly because it leaves the shelter of its woodland habitat only nocturnally for browsing, due to disturbance and hunting by humans.

The procedure we adopted was to make early morning and late evening trips to vantage points from which the seven locations could be clearly observed through binoculars. This often involved strenuous if not difficult climbing, and was most bracing even when game was not seen.

Detailed work on temperate Himalayan wildlife population cannot be undertaken without prolonged periods of residence, and better techniques which have yet to be evolved and on which the author is working.

The Study Locations:

The seven locations intensively covered represent the lushest and most favourable feeding grounds, and their associated sheltered refuges in proximate cliffs and ravines going higher up, in the three valleys. All 7 of these are occupied by shepherds and gujars during the summer and autumn months, and grazing by domestic livestock is in direct competition with the browse, available for wildlife species. On the other hand, though red bear and bharal have to take recourse to nocturnal feeding when the flocks have taken over in June and July and have to browse in second-rate grounds higher up, there is benefit from such livestock occupation in the rich fertilizer represented by the droppings of sheep and goat and buffaloes. It is this rich addition to the soil which makes of these 7 locations such favoured grounds in the months of April, May and June. The grasses browsed by bharal are given in the appendix, but the diet of red bear is mostly tuberous and much more work will have to be done on this.

All 7 locations are within close proximity of cliffs and winter-snow ravines incised into the generally less rugged environs here, so that bharal take shelter in their inaccessible heights on being disturbed and kept regarding us intruders for long hours in security. Red Bear, too,

were not unduly alarmed by the presence of the snow, and in overhangs and caves where they could find shelter.

EMERALG Parvulus mayanus

This handsome intermediate form is found in Garhwal generally, and is distinguished by a visible skin-fold in the cheeks, as well as by the shape of the horns, which are small, except for a small portion at the tip, and are not so much curved as those of the true musk deer.

In comparison with the true musk deer, the intermediate form is smaller, with marked black spots on the sides of the neck, and the horns are also shorter and less curved. The horns are also shorter and less curved.

As a physiological specimen, it is very interesting, and is found in the Himalayas, where it is found in the same range as the true musk deer. The horns are also shorter and less curved.

The intermediate form is found in the Himalayas, where it is found in the same range as the true musk deer. The horns are also shorter and less curved.

The intermediate form is found in the Himalayas, where it is found in the same range as the true musk deer. The horns are also shorter and less curved.

During the winter months, the musk deer is found in the same range as the true musk deer. The horns are also shorter and less curved.

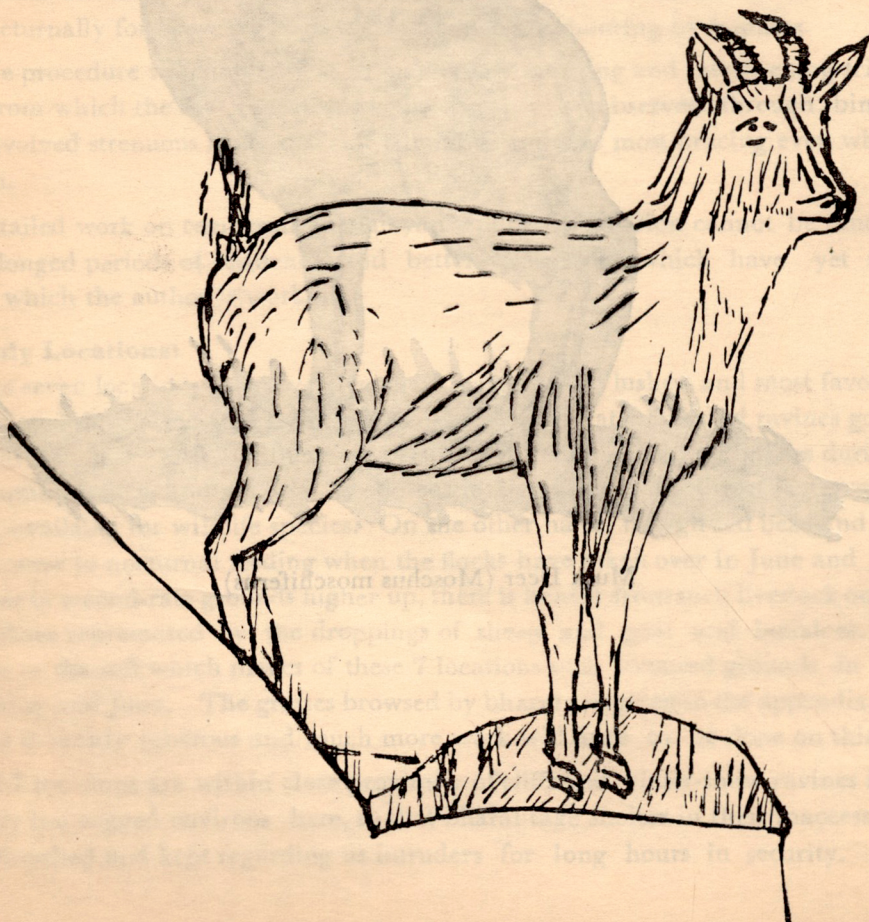
In summer, the musk deer is found in the same range as the true musk deer. The horns are also shorter and less curved.

The musk deer is found in the same range as the true musk deer. The horns are also shorter and less curved.





The Head of Goral



The Goral of Benog

were not unduly alarmed, and took shelter in the heights near melting snow, and in overhangs and caves above the snow-line often in view of us.

BHARAL: *Pseudois nayaur* (Hodgson):

This handsome intermediary between sheep and true goats, has smooth, rounded, swept-back horns, in Garhwal generally less than 26 inches. Lacking face glands, except for a visible skin-fold in the cheeks, it has glands in the hooves, lacks the characteristic reek, as well as beard, of the true goats.

In completed new pelage in November, the rams are predominantly slate-grey-and-blue, with marked black stripes down the flanks and legs, and a dark-grey to blue-black face. The undersides are lighter, almost white. The awes are brownish in new pelage, and lack the distinctive black stripes.

As physiological processes under the rigours of winter snow and lean vegetation in December slow down, the pelage begin to lose colour, gloss and smoothness, and by spring, the bharal start scraping off the old pelage against rocks, shedding the now-coarse brown hair in chunks and patches to grow it anew with the ingestion of nutritious green grasses. The horns of the rams are ringed by lines of growth, and serve as accurate indicators of age. The ewes also have horns, but these are mere spikes, often contorted, never more than a few inches.

The bharal in the Hari-ki-Dun, as all over its range, in the Himalayas, keep above the tree-line, seldom descending below even the juniper levels, though this has been observed in the Nanda Devi area, where they touch the Rishi Ganga in summer, passing below the *conifers*.

Their characteristic habitat is the alpine zone of temperate grassland, where they feed, and the arctic zone of hardy grass, mosses and lichens, where they shelter from human interference and guard against their major predatory enemy, the snow leopard, using their remarkable sense of sight over vast distances. The inferiority of their sense of smell is not conclusively proved but indicated by the facts in Figure III referring to wind-direction and reactions to us.

During the limited rich grazing months of April, May and June, they may graze intermittently throughout the day and night, hectically to make up for the lean months of the past winter and the strenuous months of the rut ahead.

In summer, they are generally found in herds of between ten and fifty, assembling into vast herds of over a hundred just before autumn, when the rams, who have till then remained alone higher up, descend to claim their respective harems, and then break up into smaller polygamous herds of ten to fifteen animals.

In summer the daily activity cycle is disrupted by the need to feed endlessly, but in autumn they feed for a few hours only each morning and evening resting in

cliffs and often in the shade of chimneys and couloirs when the sun is too bright for their now-fat-covered bodies in glossy new pelage.

Their range and movements in summer are controlled by the single-minded dedication to feeding off the lush grasses and herbs, and almost all their changes of ground can be explained thus. They descend at night to the best grazing when they fear human encampments and may be seen very early and very late in close proximity to herds of goats and sheep, as we have seen them in the Jaonli area. They overcome their fear of human beings and will not take flight in summer unless thoroughly alarmed. In autumn, they are much greater lovers of privacy, and will seek the highest scree and pastures for their mating and courtship and even the meagre browse available does not often bring them down.

The fact of their migrations from one valley to another and from one unfavourable seasonal grazing to a more favourable one are traditionally believed by villagers and this time in the Hari-ki-Dun we had illustration of such movements when a herd of 56 animals broke up on the fifth day of observation, the larger animals crossing the circa 17,000-foot-high col from Ruishar (Tons) valley across snow-slopes to Harsil or Gantraro side.

Similarly, a herd of 8 rams was seen coming over from the Jamnotri side of the Jamnotri Pass crossed by our party later, at over circa 16,000 feet, into the better grazing of the Ruishar (Tons) valley. The two cols between the Yamaduar (Jemdar) and the Ruishar (Tons) are regularly crossed by the bharal of this region, according to the venerable and redoubtable poacher-turned-village-ecologist, Hirpal Singh of Osla village. Hirpal has spent sixty summers in these valleys, has shot snow leopard and musk deer and bharal for the meat and the skins, and the pod, but is now my agent in the Tons Basin for information on wildlife and is full of invaluable if unscientific insight into the ways of these animals.

When sheep and goats and gujars come up these valleys, the bharal cross into Gantraro, and shelter in the heights, descending each evening only.

Predatory presence is clearly indicated by their nervous and often panicky behaviour when snow leopard are around. They will stamp their feet, looking in the direction of the predator, and sneeze continually. They will gather around in compact groups, with ewes on the alert, while the rams look stupidly on; cautious ewes may even approach closer, as we have seen them do elsewhere. Even human beings, unless clearly seen, arouse the same sort of behavioural pattern.

Leadership of herds rests with master rams only in autumn when the rut has commenced and the herds broken up into family units. Before this happens, the most alert ewes guide the herds' movements.

The method used for locating herds in autumn is to listen for the echoing crash and clatter of bharal horns in combat. Rams crash into each other with tremendous force and

fireworks, while the herd watches on, the ewes in groups and clusters, the lesser and younger rams in frustrated and pretended isolation. The rams get locked in combat, too, and go crashing and rolling down screees and slopes, often in snow, as observed in Ralam and Nanda Devi.

Lambs are cast throughout spring and summer, with a peak in April and May, but more data is needed on this. Gestation must be about five months, since breeding behaviour, sparring and actual copulation and mounting have been seen at their maximum frequency in November and late October.

The data from the Hari-ki-Dun on this species is not sufficient to justify wider generalisations, and it is proposed to produce a more exhaustive survey on the species to include data from all the locations in the Himalayas where the author has studied and observed this fine sheep.

Red (Brown) Bear: *Ursus arctos isabellinus* (Horsefield):—

Of the five males, two females and two cubs seen in this survey, only two males, two females and two cubs, were seen over any length of time. Each time they were engaged in rooting, digging, browsing and scratching under snow and turning stones to grub for food. This data, too, is thus insufficient for wide generalisations, and the following remarks are made on the basis of earlier studies, too, and mainly to illustrate that the Hari-ki-Dun is the most favourable location for the study of this fascinating animal, as only here and in parts of Kashmir can one see red bear for any length of time and with some certitude of success.

The Himalayan Brown, or Red, Bear is bulkier and more shaggy-coated than *Selenarctos thibetianus* (Cuvier) of lower elevations, having distinct affinities with the Grizzly. The colour of the coat changes with the season and the age of the animal, the older ones having tawnier manes, and the summer coats being paler, while autumn coats have silver-tipped hair, giving the animal a whitish appearance in certain lights.

Seasonal movements and seeding and breeding behaviours

Emerging from hibernation in March or April, they begin rooting under the snow, overturning stones and even boulders to get at the voles and marmots, and often attacking herds of sheep and goats, the flour-mills of proximate villages, caches of potatoes, or anything edible that might come their way after a lean winter when they starve through by slowing down their bodily processes in the long slumber of hibernation.

As summer approaches, they start by feeding from the lowest pastures freed of snow and clear of human disturbance, and progress to the higher grasslands as the snow melts, following close upon the rising snow-line. In early summer they may be found in the birch forests and the conifers, looking for leftover seeds from the autumn, rooting and grubbing for newts and voles. In the daytime they climb above the forest but spend nights in the birches

and in their winter quarters till May comes. Then they move to their summer homes, also overhangs and incised ravines and caves well into the snows and across them. They cross cols as high as the Jamnotri Pass at over circa 16,000 feet, as evidenced by the droppings seen by us this time, and in Ralam at over circa 17,000 feet, on snow.

Though harmless to man, when disturbed at close ranges, as by us this time, or with cubs, they can be bad-tempered and charge, after rearing up the hind legs in a threatening display of growls and grunts. This rearing on hind legs may also be to get a better look at their intruders, as they rely almost exclusively on their sense of smell, and not on sight, which they have of a very low order.

Mating takes place in November and December, as with most Himalayan wildlife, and subs are dropped by late autumn, and move about with their mothers, (never with their male parent) by late spring and early summer. Several generations may form family parties especially in autumn, when in the same Ruishar locations in 1953 and 1954 we saw as many as five bears together on the same alp.

Once the edge is gone off their appetites by September, red (brown) bear become choosy, and move towards human habitations for preference, to steal flour from mills, buckwheat from fields, and to often wantonly kill large numbers of sheep of whom they consume only the uders and softer portions. They dig the fresh-moistened softer alps for the roots of edible plants, and the males may show a preference for meat at this stage.

They are capable of fairly rapid locomotion, and travel great distances, often feeding off mushrooms (guchhi) near melting snow, and buckwheat five thousand below, in the same day.

Caves and overhangs abound in the forests of birch and rhododendron, and the twisted and gnarled trunks of these trees, often swept downhill by avalanches of winter snow, offer ideal sheltered refuges for red (brown) bear. Many such observed showed signs of occupation by the animals, and one was actually driven out of such a one by the beating of tin cannisters by our porters.

They feed in the early mornings and late evenings, but throughout the day on misty days, the clouds giving them a sense of security. They become quite nonchalance in cloud and mist and can be most easily approached then. Bharal and red (brown) bear often feed together on the same alp, and this time we found three ewes feeding for two hours within fifty to two hundred yards of a red (brown) bear with cub.

One must stay through the winter in the Har-ki-Dun to gather more reliable data on the red (brown) bear and in fact on all Himalayan fauna in this region. On the basis of available evidence, more cannot be said.

Excerpts from diary: May 30th to June 4th.

Started from Ruisher Tal at 4.00 a.m. and traversed grassland slopes along true right bank till a cliff, from which a good view is had of the drier grassland slopes directly above the true right bank of the glacier of the Bandarpunch.

Spotted movement of bharal, one mile away, with Hirpal's help. Climbed down, taking shelter of morainic rubble, to climb up above the bharal herd. Crept along a snow-choked ravine, and slithered up wet grass and scree to a vantage. Clustered together on a wind swept hollow, with the mist glancing off the slopes, a herd of some forty bharal. Waited an hour for an opportunity for a photograph, but the mist converged. Crept closer to try a picture of a group of five young rams higher still, but three hinds gave the alarm on sight, not smell. The entire herd scampered off, down to another snow-choked ravine, and up a ravine and across a grass-covered hanging valley. Counted the racks of fifty six animals, many evidently mere lambs.

The herd crossed the ridge, and came back, some two thousand feet higher up, traversing on steep snow and tongues of ice, and then actually descended to gaze curiously at the red tent pitched by Hirpal, Elgin and myself. They browsed and the rams chased each other, on steep cliff country, till nightfall.

Up at 5.00 a.m. Biting cold wind, blowing off the peaks of Black Peak and Bandarpunch, downhill. Moved up the true right, to climb a scree-and-grass knoll at fifteen thousand feet: no sign of bharal.

At noon, the herd seen again, this time on the Swergarohini hanging glacier, on brown-honed rock: only twenty animals. The rest seen at 2.00 p.m. on a grassland ablation valley just above the glacier, where it plunges down from its ice-fall below the Harsil pass, grazing within five hundred yards of two red (brown) bears!

Next morning, again, the same herd was back on the same cliff and poor grass above the red tent. This time we climbed up the ridge leading to the brown-honed glacier rocks, and found the herd well below us near the grassland ablation, this time without the red (brown) bear. We got to within 100 meters, and counted 14 rams, 23 ewes, 19 lambs.

Watched them for three hours, when they descended and crossed a landslide on the glacier! We returned to the red tent.

On the 6th of June, the same herd, now splintered into groups, crossed the neve and snow slopes below the Harsil pass and disappeared over the ridge. Only the rams seemed to have crossed, but this could not be confirmed, as we had to climb Black Peak, and were too busy for two days to think of bharal.

3rd June: Left the red tent at 4.00 a.m. and had breakfast off sattu and gur at a stone kharka used by shepherds just below the grassland ablation. A red (brown) bear and a cub

were rolling over stones and feeding noisily on the grassland of the ablation. Elgin and I approached down the old and lichen-encrusted boulders of a moraine, and got to within fifty yards, and as I adjusted the 400 mm lens on the camera, the cub must have seen or smelled us, being nearer, and came closer to take a look. The female, for presumably she was the mother, growled, and followed the cub, and then smelled a rat...or us; she stiffened, smelled the air, turned around, sniffing and nuzzling, and I dropped my ice-axe. Even then she did not see me. But she came closer and then looked short-sightedly at me. I was wearing mountaineering boots because of the snow slopes. we had had to cross, and shouted to Elgin to run, making as much noise as he could. But she did not see him, and charged at me. Frightening moment, for we were entirely without weapons, and she was a bare fifteen yards, or less, when the cub, till then sniffing around, ran towards the glacier, and the mother bear mercifully followed, leaving two of us to heave sighs and move to higher ground the security of distance. The female and cub went down the mud-and-dust-and-scrée glacier walls and we found her tracks across on the other side on the 6th of June.

Other locations and the population of bharal and red (brown) bear in the Upper Tons Basin.

Despite competition from sheep, goats and the buffaloes of gujars, it seems there are fair numbers of red (brown) bear and bharal still surviving in the three valleys of the Upper Tons.

A conservative estimate would be fifty red (brown) bear and five hundred bharal, but this does not take into account the evidence in favour of seasonal migrations for the better forage. In winter, perhaps, there are far fewer bharal and possibly fewer red (brown) bear in these valleys than come to them in summer and autumn.

Both banks of the Tons (Ruishar) river abound in lush grasslands in the months from April to November, and we counted over twenty such maidans extensive enough to mention. The Morinda and Yamaduar valleys have less red (brown) bear and bharal country, specially the Yamaduars but even there the habitat is plentiful for a summer and autumn population. There are numerous rock caves in birch and rhododendron forest for the hibernation of bear, and even bharal might be eking out an existence in the winter months, scratching and licking salt and lichens off high rock faces, as they have been seen to do by villagers.

Conclusion

Though thar, goral, musk deer, snow leopard, marmots, voles, serow, pheasants, snow-cock, snow-partridge, and even black bear can be observed within Govind Pashu Vihar, it is the red (brown) bear and the bharal which are the most characteristic and plentiful species of this sanctuary. To increase their numbers and to make them more easily visible to tourists who visit the sanctuary, some steps can be taken. One necessary, though possibly double-edged remedy is to prevent the gujars from moving up to the higher pastures beyond the rest

house in the Har-ki-Dun, and thus eliminate a possible cause of competition for browse, as well as of disease. Buffaloes, sheep and goats very probably, though not definitely, graze the same browse species as the bharal and even the red (brown) bear, and with so many other valleys available, it seems a shame to allow such competition in areas reserved for wildlife. Gujars and herds of sheep and goats are a picturesque addition to these valleys, and should be allowed to graze within the timber-line but not beyond.

A bridle, mule-track should be constructed up the Ruishar (Tons) valley, as has been done for the Har-ki-Dun, and a rest house should be built for the convenience of visitors near the Rusher Lake. No other human habitation of a permanent nature be permitted within the Upper Tons Basin, nor should a motorable road ever defile the hallowed silence and tranquility of the swards and the snows of this potentially the most popular and practicable Himalayan Sanctuary.

There appears to be a much larger spread of the dwarf rhododendron (*R. anthopogan*) and *Cassiope festigiata* zone in the Ruisher and even the Morinda and Har-ki-Dun valleys than is desirable, considering that neither of these widespread bushes are browse species. Though further investigation will be needed before a decision can be taken, the possibility of burning off some hillsides covered in this dwarf vegetation should be kept in mind, to provide better forage and browse for the wildlife species like the bharal and the musk deer, the red (brown) bear and the associated predator the snow leopard.

These are some of the ways in which the Hari-ki-Dun area can be made truly a sanctuary which can show Himalayan wildlife to visitors. The upper Basin of the Tons, here described, should not be treated on the same terms as the rest of the Supin Range Sanctuary, because of the impracticability of exercising effective control over the vaster area, whereas the posting of a Warden at Osla or Sima Rest House is a distinct possibility.

Acknowledgments

The author wishes to thank the U.P. Forest Department for their kind co-operation and help. Mr. K.C. Sahni has been most helpful in letting me use his lists of plants and grasses of the Tons region, and for correcting the nomenclature and distribution. The errors, thus left, are all mine!

The late Sri E.P. Gee further deserves my gratitude for his encouragement in the Himalayan wildlife programme. I would also like to thank Dr. George Schaller and Dr. T.H. Bassett for their help, guidance and encouragement. Of course, none of them are to blame for the defects and shortcomings of this preliminary report.

Lastly, I would like to thank the Wild Life Preservation Society for their constant and continued help and encouragement, particularly Dr. R.N. Misra and Sri S.S. Negi, Retired Conservator of Forests, and the late M.D. Chaturvedi, I.F.S., Retired I.G. Forests, India.

Figure II

VISUAL OBSERVATION

In Temperate Grasslands Habitats of the Upper

Species	Location No.	*Number seen in Each Location	Time	Duration	Age & Sex Composition
Bharal <i>Pseudois</i> <i>Nayaur</i> (Hodgson)	1	4	1400 hrs	4 hrs	2 ewes, 2 lambs
	2	12	0800 "	2 "	?
	3	12(x3)	(a) 1800 "	1 "	?
			(b) 0700 "	3 "	?
			(c) 0700 "	1/4 "	There were only 2 ewes
	4	14	1600 "	2 "	3 rams 6 ewes 5 lambs
	5	56(x6)	(a) Five days. Dismal climbing & descent		14 rams 23 ewes 19 lambs
			(b) 0600 "	8 hrs	At a height of 17000 ft on snow
	6	8	1100 hrs	2 hrs	All 8 rams
	7	7	0800 "	1/2 "	3rams
Red (Brown) Deer <i>Ursus Arctos</i> <i>Isabellinus</i>	1	nil			
	2	nil			
	3(a)				
	(b)	2(x2)	0900 hrs	2 hrs	1 female 1 cub
		1	0500 "	1/4 hrs	1 male
	4	1	1900 "	2 min.	1 mate
	5(a)	2(x3)	1400 "	1 hrs	1 female 1 cub
	(b)	1(x2)	1600 "	5 min	1 male
	6	2	0800 hrs	3 hrs	2 male
	7	nil			?

*If seen more than once in the same

OF BHARAL AND RED DEER

Tons in Seven Study Locations in May and June, 1968.

Bistance Approached	Activity	Direction in wind with respect to vsewer	Remarks
300 metres	Browsing	Sideways Upwind	Curiosity
1 km	Idling in sun		
500 metres	Browsing	Upwind	"
"	"	Downwind	"
300 metres	"	Upwind	Alarmed and ran up ridge
100 metres	"	Upwind	Unaware. Ran up ridge on seeing us.
100 to 1500 metres	Browsing, idling, Sparring, copulating & defecating	All winds; often clearly in sight	Cautious; curiosity with spells of alarm and panic Curiosity
1 km	Idling, browsing lichens.	Downwind	
500 metres	Browsing on high elevation; lichens on snow.	Downwind	Alarm; escape
1000 metres	"	Upwind	nil
500 metres	Digging & browsing	Upwind	Unaware
30 metres	"	Upwind	Alarm, grunt, escape on sight after feint charge
50 metres	In birch stand	Upwind	Immediate escape
30 metres	Digging & feeding	Variable	Chased and retreated to cub, & down to glacier.
100 metre	-do-	Variable	Ran up to glacier
50 metre	Digging, Feeding in melting snow	Variable	Ran up into rhododendros

location, the number of times is shown in brackets.

Select Bibliography and References

The Palaearctic mammalia of the Himalaya and associated mountain ranges of the U.S.S.R., Afghanistan, Pakistan, India, Tibet, (China), and Bhutan, has been the subject of taxonomic study and systematic mammalogy by the late J.L. Chaworth-Musters, whose work was posthumously completed in 1951 by J.R. Ellerman and T.C.S. Morrison-Scott in their "Checklist of Palaearctic and Indian Mammals", (British Museum, Natural History, London).

No correspondingly comprehensive ecological study of Himalayan and Palaearctic Mammals has ever been attempted. The following is a select bibliography of some of the major works in this field:

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Jerdon, T.C. The Mammals of India.

Wroughton, R.C. et al: Results of the Mammal Survey, J.B.N.H.S.

Prater S.H. (Revised) 1965: The Book of Indian Animals.

Tate, G.H.H. 1947: The Mammals of Eastern Asia.

Even the above mentioned works are systematic and descriptive, rather than ecological, and did not meet our needs. In fact, the most informative works are often the travelogues and hunting accounts of writers like Lydekker, Stockley, Houghton, Bailey, Kingdon Ward and the earlier explorers. Of proper ecological work, only two authors have worked in the field since independence. E.P. Gee, the late author of *The Wild Life of India*, produced a report on the Kashmir Stag of the Dachigam Sanctuary near Srinagar, and the present author has produced reports on the Inner Sanctuary of Nanda Devi, on the Buddhist preserve at Thyangboche, on the snow Leopard, the musk deer and the goral.

Appendix I

List of Plants observed in the Tons-Division particularly in Harki-Dun.

- Anemone rivularis*—A tall herb in the open at 9,000 ft.
Aconitum falconerii—Tall herb with deep blue flowers, common at 11,000 ft.
A. heterophyllum—Herb with dark violet flowers at 10,000 ft.
Anemone obtusiloba—Herb with brightish blue flowers at 11,500 ft.
Anemone vitifolia—A tall herb with white flowers at 7,500 ft.
Clematis connota—Climber at 8,000 ft.
Delphinium vestitum—Herb with bluish flowers at 10,000 ft.
Delphinium brunonianum—Herb with bright blue flowers, corolla hairy, at 13,000 ft.
Ranunculus laetus—Herb with yellow flowers at 7,500 ft.
Thalictrum reniforme—Herb at 9,000 ft.
Thalictrum elegans—Herb at 12,000 ft.
Berberis umbellata—Shrub with reddish fruits at 11,700 ft.
Holboellia latifolia—Climber with digilite leaves and follinder fruits at 7,800 ft.
Corydalis ramosa—Herb with yellow flowers close to stream at 13,500 ft.
Corydalis govaniana—A robust herb with yellow flowers at 13,000 ft.
Meconopsis aculeata—Herb with sky blue flowers at 13,500 ft.
Arabidopsis stricta—A crucifer with light purple flowers at 8,000 ft.
Capsella barsa pastoris—A herb with white flowers in meadow at 12,000 ft.
Viola patrenii—Herb with violet flowers at 7,7000 ft.
Cerastium daburicum—Herb with white flowers at 10,000 ft.
Gypsophila cerastioides—Herb at 10,000 ft.
Lychnis nutans—Herb at 11,700 ft.
Lychnis indica—Herb with pink and white flowers at 8,500 ft.
Silene inflata—Herb at 8,000 ft. white flowers.
Myricaria bracteata—Shrub in dry stony stream at 11,500 ft.
Hypericum elodeoides—A herb with yellow flowers at 7,500 ft.
Hypericum lysimachioides—Shrub with yellow flowers at 6,000 ft.
Hypericum patulum—A herb with light violet flowers at 7,500 ft.
Geranium nepalense—Herb with pink flowers at 8,000 ft.
Geranium wallichianum—A herb with pinkish flowers at 12,000 ft.
Impatiens bicolor—Herb with white flowers, at 9,000 ft.
Impatiens roylei—Tall herb with deep pink flowers, fairly common.
Impatiens scabrida—A hairy herb with bright yellow flowers; common at 9,000 ft.
Impatiens thomsoni—Herb with pink flowers at 11,700 ft.
Boenninghausenia albiflora—A herb with white flowers, leaves, gland dotted at 7,500 ft.

- Euonymus mbriatus*—Shrub at 8,000 ft.
Vitis semicordata—Climber at 9,000 ft.
Rhododendron anthopogon
R. lepidotam
Cassiop festigiata
Astragalus himalayanus—Herb with blue flowers at 11,700 ft.
Desmodium polycarpum—Shrub at 7,000 ft.
Desmodium telaefolium—A shrub at 7,000 ft.
Lespedeza gerardiana—Herb with yellowish flowers at 7,800 ft.
Lotus corniculatus—Herb with yellow flowers at 8,500 ft.
Parochetus communis—Herb with blue flowers at 8,500 ft.
Thermopsis barbata—Herb at 12,000 ft.
Trigonella emodi—Herb with yellow flowers in meadow at 12,000 ft.
Vicia pallida—A climber with lilac flowers at 7,500 ft.
Agrimonia eupatorium—A herb with yellow flowers at 9,500 ft.
Cotoneaster bacillaris—Shrub with reddish fruits at 9,500 ft.
Cotoneaster microphylla—Shrub at 11,700 ft.; fruits red.
Crataegus crenulata—A shrub with deep red berries at 9,500 ft.
Geum alatum—Herb with yellow flowers at 10,000 ft.; common.
Lonicera parvifolia—Shrub with bright red fruits at 11,700 ft.
Potentilla ambigua—Small herb with yellow flowers at 10,000 ft.
Potentilla atrosanguinea—Pretty herb with dark red flowers at 11,000 ft.
Potentilla fulgans—A herb with yellow flowers at 7,500 ft.
Potentilla eriocarpa—Herb with bright yellow flowers on rocks at 13,000 ft.
Potentilla nepalensis—Herb with red flowers at 10,000 ft.
Pyrus vestita—Small tree; leaves tomentose and whitish under surface.
Pyrus foliolosa—Large shrub at 11,700 ft.
Prunus cornuta—small tree at 11,700 ft.
Rosa macrophylla—Shrub with oblong red fruits at 9,500 ft.
Rosa sericea—Shrub with bright red fruits at 8,500 ft.
Rosa sericea—Shrub with bright red round fruits at 9,500 ft.
Rubus lasiocarpus—Shrub with reddish flowers at 8,000 ft.
Spiraea canescens—Shrub at 8,000 ft.
Spiraea vestita—Small shrub at 11,700 ft.
Deutzia staminea—Shrub with leaves having whitish under-surface.
Parnassia nubicola—Herb with white flowers at 11,500 ft.
Parnassia nubicola—Herb with white flowers at 11,700 ft.
Ribes glaciale—Large shrub at 11,700 ft.

- Saxifraga saginoides*—Cushion like herb with yellow flowers at 14,500 ft.
- Saxifraga diversifolia*—A herb with yellow flowers at 7,500 ft.
- Saxifraga diversifolia*—Herb with yellow flowers at 11,500 ft.
- Saxifraga brunoniana*—Herb with yellow flowers at 12,000 ft.
- Saxifraga hirculus*—Herb with light yellow flowers at 13,000 ft.
- Sedum multicaule*—Herb with bright yellow flowers at 13,500 ft.
- Sedum asiaticum*—Herb with reddish flowers at 12,500 ft.
- Sedum asiaticum*—Herb with yellowish flowers.
- Sedum crassipes*—Herb with red flowers at 11,000 ft.
- Sedum ewersii*—Herb with flashy leaves and reddish flowers at 11,500 ft.
- Drosera peltata*—An insectivorous plant at 7,000 ft.
- Epilobium latifolium*—Herb with pink flowers at 14,200 ft.
- Epilobium latifolium*—Herb with pink flowers near streams at 12,000 ft.
- Epilobium organifolium*—Herb with deep purple flowers at 10,000 ft.
- Epilobium roseum*—Herb with pink flowers in dry stony stream at 11,700 ft.
- Oenothera rosea*—Herb with deep pink flowers at 11,000 ft.
- Begonia picta*—Herb with pink flowers at 6,800 ft.
- Chaerophyllum acuminata*—Tall herb at 11,700 ft.
- Heracleum brunonis*—Herb with hairy leaves at 11,000 ft.
- Pleurospermum dendriflorum*—Herb with white flowers at 12,000 ft.
- Pleurospermum densiflorum*—Aromatic herb with white flowers at 11,500 ft.
- Pimpinella diversifolia*—A tall herb with white flowers, stem and leaf mainly hairy, at 15,000 ft.
- Pleurospermum stellatum*—Herb at 11,000 ft.
- Selinum tenuifolium*—Tall herb with white flowers at 11,000 ft.
- Aralia cachemirica*—Shrub at 8,000 ft.
- Leycesteria formosa*—A shrub with white flowers; stem hollow; berries reddish, at 7,500 ft.
- Lonicera alpigena*—Large shrub with bright red purple fruits at 11,700 ft.
- Viburnum nervosum*—Shrub with deep red berries at 11,000 ft.
- Galium aparine*—Tiny herb on moist ground at 11,700 ft.
- Galium asperifolium*—Small herb at 7,800 ft.
- Galium rotundifolium*—Herb with whitish flowers.
- Morina longifolia*—Herb with pinkish flowers; common below 10,500 ft.
- Anaphalis araneosa*—Hairy herb with white flowers at 6,000 ft.
- Anaphalis cunefolia*—Herb with white flowers at 12,000 ft.
- Anaphalis contorta*—A pubescent herb with white flowers at 10,000 ft.
- Anaphalis triplinervis*—Herb at 9,000 ft.
- Arctium lappa*—Shrub close to Gujar's huts at 10,000 ft.

- Artemisia scoparia*—Herb at 5,200 ft.
Artemisia vulgaris—Aromatic herb at 8,500 ft.
Aster falconeri—Herb with deep violet flowers at 11,700 ft.
Aster stracheyi—Pretty herb with violet flowers at 11,700 ft.
Brachyactis robusta—Herb at 12,000 ft.
Cardus nutans—Tall herb with reddish flowers.
Cnicus falconeri—Tall composite at 11,700 ft.
Dubyaae hispida—Herb with yellow flowers at 12,000 ft.
Erigeron alpinus—Herb with flowers at 6,000 ft.
Erigeron linifolius—A herb at 7,500 ft.
Erigeron multiradiatus—Herb with bright violet flowers at 11,700 ft.
Erigeron multiradiatus—Herb with violet flowers; common at 10,500 ft.
Erigeron multiradiatus—Herb with bright violet flowers at 11,500 ft.
Polypodium juglandifolium—A large fern at 6,800 ft.

Characteristic Grasses & Sedges:

Gradual altitudinal changes alter the character of Himalayan flora, viz., grasses. Sub-tropical forms change to temperate around 7,000 feet to 8,000 feet altitude, e.g., European and American genera like *Avena*, *Brachypodium*, *Bromus*, etc.

Higher still occur the *Dactylis*, *Festuca*, and others identical with European, North American and coastal arctic types, especially near melting snow.

The nutritive value of these has not been the subject of separate research, but excellent pasturage on the seasonal maidans is provided for sheep and buffaloes as by the high-nutrition alpine species.

Agropyrum caninum (also spp. *longiaristatum*, *semicostatum*)

Agrostis alba (also spp. *ciliata*, *Hookeriana*, *Roylei*)

Avena pratensis (also *pubescens*)

Bromus crinitus

Calamagrostis scabrescens

Danthonia kashmeriana

Festuca filiformis (also *ovina*)

Heirochloe laxa

Phleum alpinum (catstail) around 12,000 feet.

Poa alpina (also spp. *arctica*, *annua*, *attenuata*, *bulbosa*, *cenisia*, *compressa*, *laxa*, *nemoralis* and *pratensis*)

Stipa sibirica (poisonous)

Eragrostis nigra, around 8,500 feet.

Carex strata, around 13,500 feet.

Agropyron linge-aristatum around 13,500 feet.

Agropyron semicostratum up to 9,000 feet.

Festuca valesiaca around 12,000 feet.

Agrostis stolonifera around 12,000 feet.

Arundinella nepalensis around 12,000 feet.

Some Characteristic Trees: Broad-leaved species:

Aesculus indica; Sapindaceae (Horse Chestnut)

Acer oblongum, also *pictum* (Himalayan Maples)

Prunus cornuta; Rosaceae: Padam

Pyrus pashia ,, Wild Pear

Fraxinus excelsior; Oleaceae: Himalayan Ash

Morus serrata, Urticaceae: Mulberrys

Ulmus walliciana; Ulmaceae: Himalayan Elm

Juglans regia; Juglandaceae: Walnut

Betula utilis; Cupuliferae: Silver Birch, Western Himalaya from 10,000' to 13,000' to 5,000' to 7,000'

Alnus nepalensis; ,, Himalayan Alder

Quercus semicarpifolia ,, High level Himalayan Oak

Quercus serrata ,, ,,

Castanea sativa; ,, : Chestnut, Introduced from Europe

Populus alba (and *ciliata*) Salicaceae : Poplars

Salix alba (also spp. *tetrasperma* and *babylonica*); Salicaceae: Willows.

Conifers:

Abies spp. pindrow from W. Asia and *spectabilis*—Western Himalayas Coniferae: Fir and High hevel Fir.

Cedrus deodara; Coniferae : Deodar or Himalayan Cedar

Picea smithiana (morinda); ,, : Spruce

Pinus wallichiana (excelsa) ,, : Blue Pine

The Musk Deer of the Himalayas

Contribution to the Ecology of Musk Deer, *Moschus moschiferus*, Linnaeus, 1758

By

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Classification and Systematics:

Belonging to the Sub-order Artiodactyla of the Order Ungulata of Class Mammalia, it is classified within the Family Cervidae as a distinct Sub-family, Moschinae. Ellerman and Morrison-Scott in their authoritative Checklist follow Simpson (1945) who places *Moschus* alone in this Sub-family. Peacock (1923) and Lydekker (1924) also anticipated a similar classification, though they differ in their generic division of the deer, from Simpson.

The Sub-family Moschinae differs from the Cervinae in lacking foot-glands, face-glands and antlers, and in possessing a gall-bladder and a caudal gland. The absence of antlers points to wide evolutionary differences between these primitive types of deer, like the *Moschus* and the *Hydropotes* (Chinese Water-Deer), and the rest of the antlered deer. Hence, this Sub-family is well-merited, all the more so in view of its possession of the unique musk-gland. Lord Rothschild seems to classify *Moschus* as a separate Family within his Sub-order Ruminantia (1965), which may be better for placing Moschinae between Caprinae and Cervidae.

Description and Size:

A diminutive, unantlered, agile animal, it stands between 18 inches and twenty four inches at the rump or croup, and nearly two inches less at the withers or shoulder. Its coat is of pithy, cylindrical, thick and almost hollow bristly hairs like small porcupine quills, and the predominant shade is mottled and speckled dark-brown. The speckled appearance is the result of the individual hairs being grey-to-white in their basal half, with ringed white middle portions, and brown to almost black tips. In winter I have noticed the tips, too, become grey to white, giving the animal an almost snowy appearance from a distance. Though there is a single white throat-spot on either side in all musk deer, the younger animals seen had traces or linear grey-to-white spots on the dorsal pelage. The undersides are lighter, as are the insides of the limbs. There seems to be much variation in shade and even texture between animals collected or seen in different seasons and from different areas. Bright copper and pale yellow shades are often observable on dorsal pelage especially in autumn and winter.

Though the bucks have sabre-shaped, and highly developed upper tusks or tushes, even females show an elongation of upper tusks. The lateral hoofs of each foot area elongated, and the inner hoofs are pointed, the tracks showing this clearly. The imprint when seen on snow suggests a utilitarian causation, as they must serve for better holds on snow, and wet rocks. The hind heel then touches the ground.

The musk deer appears dumpy and clumsy, with heavy legs, the forelegs markedly shorter; but once it moves, in lightening and brisk bounds, the pith-like coarse insulation of spiral hairs bristling as though with electric power, it is agile and athletic. The ears are flappy and large, and the tail in the female somewhat bare on the underside. In bucks, at any rate, the tail is well-compacted into the anal pelage, scarce visible. When opened, it shows bare patches and folds of skin on the lateral and undersides: this is the well-known caudal orifice or gland, which exudes a waxy yellow substance, often observable.

The musk-gland, prime cause of the animal's pursuit by poachers, is just under the abdominal skin, and emits a powerful odour, pungent and rather unpleasant, when freshly skinned, but musky and fragrant in small traces.

Distribution and Range:

The Altai, Siberian mountain-taiga from Yenesei to Kolyma, Ussuri, Mongolia, Manchuria, Korea, Tibet, Szechuan, Shensi, Shansi and Kansu. From Kashmir to Sikkim, including Assam (Cachar?) and Northern Burma (Tate, 1947).

Within the Indian Himalayas, on second-hand evidence, optimum conditions and most prolific distribution appears to be in the Buddhist Himalayas of Nepal, Bhutan, and in the inaccessible valleys without motor roads, of Garhwal and Kumaon, especially those with widespread grassland and salix-juniper-birch associations, with many hollows. We saw one at Mandali once, at only 7000', in deodar forest, and it is reported from Nag Tibba (9900')

Characteristic Habitat and Plant Associations:

One was shot in 1954, near Mandali FRH, by the D.M., Dehra Dun.

Cover:

Though there is some seasonal altitudinal migration, and though most of their feeding seems to be in the grasslands of the alpine, and montane tundra zones, merging even into the lichens higher up, it is clear that the proximity of the lower nival zone, of plentiful cover in the spruce-fir forest, and the salix-juniper-birch association, is the truly controlling factor. This, though the entire nival zone, from spruce, fir, bush rhododendron, birch and juniper, right up to the arctic zone is the habitat, within this habitat, musk deer show preference for terrain which affords an association of vegetation-cover and alpine pastures, of forest-shelter and open meadowland. The factor could well have been the plant associations which

such juxtaposition affords, but in view of our study, the controlling factor is the shelter of the forest-cover. Thus, such juxtaposition favours the presence of musk deer; absence of forest-cover inhibits it. Our record of diurnal activity will clarify this point.

Forage and Browse:

The plant associations of each zone are given in the Appendix to the Preliminary Ecological Survey of the Har-ki-Dun in this issue of CHEETAL.

Temperatures: Though often seen playing, browsing or peregrinating over sunny and concave grass slopes which attract the warmth of insolation, musk deer are better insulated than 'air-conditioned', and I have never seen one to remain in the sun for long. They move daily to the zone of the alpine grassland and mountain tundra from their hollows in the forest, but are seen out most often on cold, windy and misty days, and can then be approached close easily.

Water: No recorded instance of musk deer drinking at pools, lakes or streams is known, but I have seen one licking the drip off high cliff-rock, which might have been for salt, lichens or water.

Forms and Hollows: Figure II gives some idea of the preference shown in this regard.

Figure II: Hollows occupied or recently occupied by Musk Deer and their Habitat Zones : Based on those seen by Author, only.

Conifer forest : 7	Rhododendron and Birch thicket : 88
Mixed deciduous broad-leaved and conifer : 16	Juniper and grassland : 64
Birch forest : 8	Grassland and cliff country : 39
Birch-Salix-Juniper: 107	Sere and cliff below snow : 3

Caves: Caves were often found to have been occupied by musk deer, by the pile of dung pellets. These were generally above the forests, so that they might have been mere bivouacs for the night. These high caves and overhangs, I suspect, are not 'normal' hollows, as those are most numerous in the dwarf rhododendron-birch and birch-salix-juniper thickets. Caves, in fact, seem to be bivouacs for the autumn period, when musk deer move higher for feeding off lichens and mosses, after a summer and monsoon spent feeding off lush grasses, herbs, leaves and flowers.

Population:

Status: Much depleted in numbers, even wiped out altogether from certain of the more accessible valleys of its range in the Indian Himalayas, musk deer are still nowhere near the verge of extinction. Within this range, they are plentiful only in restricted valleys.

Numbers: It would be over-ambitious to attempt an estimate of population-figures, but in those valleys where inaccessibility has eluded the poacher's gun, and natural, generally feline, predation is the only factor, musk deer are plentiful; far more so, for example, than snow leopard or red bear. Their numbers would be between five and ten times those of snow leopard in the Indian Himalayas, which was estimated at around 400; this gives us between 2,000 and 4,000 as a working figure. (The Snow Leopard and Its Prey, By Hari Dang, CHEETAL, Vol. 10, No. 1. Pp. 72 to 82). This seems well borne out by the figures for musk deer skins reaching major Himalayan markets each winter. But the figures for musk pod and musk exported from India, alone, give a far greater estimate. If India is actually exporting crores worth of musk, even at Rs. 500/- per average musk pod of 1 ounce, then musk deer should have been exterminated to extinction long ago! The answer to this contradiction lies in the merciful if unscrupulous adulteration of musk. One musk-pod, KS, my shikari of many seasons, told me, can be made to serve for the 'craft-manufacture' of several counterfeit or 'diluted' pods. Perhaps, four or five are sold for every one really shot!

Sex and Age ratios: Our figure I gives some idea of the numbers of male (generally single), female and fawns seen, but they are not representative figures, as we moved mostly at the higher frontiers of its habitat. It would seem, though, that being an annually pair-bonding animal, even if the male might conceivably mate with two or more different females per season, the number of male musk-deer must be smaller than the number of females, because of the greater hunting-pressure on the bucks for their valuable musk-pod. Villagers seldom trail, with dogs, female musk. Much more work needs to be done on this.

Movements:

Seasonal: Winter and extreme cold probably does not bother the musk deer, as its pithy and thick-set coat of long hairs probably offers complete insulation on dry ground. But deep snow would inhibit its continued presence in the higher frontiers of its habitat. Shikaris report unanimously a general moving down into forest and thickets with the advent of winter-snow, and even our own limited experience points this way. When the snow lies deep, dry grasses and mosses and lichens would be the only available diet, with some leaves and possibly roots, which we saw one digging once, even in the monsoons. They probably take shelter from the deep snow and the wind, in the warmth and relative dryness of the forest growth. It is in the spring and the monsoons that musk deer move above the forest growth, browsing and grazing through clear nights. In the autumn, with their coat renewed and rendered sleeker and glossy with rich nourishment, they are found the highest (Figure I), (See page 88) even being seen on snow.

Daily Activity Cycle: Each individual animal seems to select one particular locality or valley or hill-face, sticking to it faithfully. This is especially so in its lower ranges, where favoured terrain is restricted. Within this locality, each musk deer has boundaries demarcated, possibly

Figure 1 :

Contribution to the Ecology of Musk Deer

RECORD OF ANIMALS SEEN SINCE 1953

Location	Month	Altitude	Habitat and terrain	Number
Pindari	September	11,000'	alpine grassland	1 male
Kaphini	September	12,000'	alpine grassland	1 male
Pilti Gad	October	14,000'	moss and lichen cliffs	1 male
Raj Ramba	June	14,000'	scree and grass above birches	2
Birj Ganga Dhura	October	12,500'	grassland	1 male
Harsiling	July	12,000'	birch and high level fir	2
Yangchar Dhura	July	17,000'	scree and lichens	2
Lissar Valley	July	12,000'	juniper and salix shrubs	1 male
Kala Baland Gl.	July	12,500'	snowfields & glacier	1 male
Ralam glacier	October	11,000'	juniper, salix and birch	1 male
Chor Ramba Gl.	August	13,000'	thin Poa grasses	3
Lata Kharak	May	13,500'	lush grasslands above birch	2
Dharanshi	June	11,000'	boulders below cliffs of grass	1
Dibrugheta	July	13,000'	birch and dwarf rhododendron	3
Deodi	July	9,500'	mixed forest of deciduous and conifer	1
Rishi Gorge	June	13,500'	grassland above forest	2
Inner Sanctuary (Nanda Devi)	June	14,000'	grasslands well above forest is high snow	1
Bethartoli in Trisul Nala	July	12,000'	grassland pasture : lush	2
Trisul Nala	July	13,000'	Lush pastures above glacier	1
Thyangboche in Nepal	April	13,000'	conifer and birch forest, with cotone- aster and salix and rhododendron: near to the Monastery and human habitation. Seen several times, in company with other.	
Tse La, Kameng, NEFA	November	13,000'	grassland above forest	1
Tse La and Lap	December	12,000'	grassland near juniper and salix and cotoneaster and berberis.	

(*Moschus moschiferus*, Linnaeus, 1758) :

(fifteen years) for more than five minutes :

Young	Activity	Scent	Reaction to: Visibility
nil	browsing	nil	alarm, escaped uphill into ravine
nil	browsing	nil	alarm, escaped uphill into ravine
nil	browsing	nil	curiosity : kept licking rock till shot.
1	moving down ?		descended into birch-salix Forest.
nil	resting in hollow	nil	Shot by KS in hollow
1	resting in lee of cliff Doe and fawn allowed a close approach.		
1	travelling down to glacier ever snow field.		
nil	Resting in hollow when shotly KS with SBML.		
nil	Crossing glacier from shh into shaded true right.		
nil	Descended to valley from hollow in forest.		
2	Peregrinating on patches of snow with fawn.		
nil	Crossed over the ridge into the Rishi basin.		
nil	Went up the cliff into overhang country. Browsing.		
2	Browsing Browsed over the horizon after playing 1 hr.		
3	Could not confirm : Disappeared in forest growth.		
1	Browsing and peregrinating. Disappeared into snow		
1	Browsing and erring aimlessly.		
1	Grazing off flowers and herbs : Confiding and curious.		
nil	Browsing and grazing off herbs and flowers.		
1	Confiding		
nil	Browsing No alarm, only curiosity.		
nil	Desended into forest.		

by the stances where droppings are shed. This is mere conjecture and needs to be further studied for confirmation, but that they defecate only at these 'dung-heaps' is established, and such behaviour is not without parallel in other animals. They scrape out with their feet a shallow 'form' on soft ground to lie down, and spend the daylight hours mostly in this fashion, especially on sunny days. Such forms are made always in shaded parts very often in thickets of rhododendron not penetrable even by dogs, snow leopards and humans.

Each evening, on sunny days, they begin to move about, showing a decided preference for difficult ground, either for the plant-food or for the thrill and the 'air'. They have a distinct sense of 'play' and relish long bounds on all fours, and will err their way up long rocky hillsides, finding tenuous routes up the most impossible rocks, to graze in "highest worlds of stances impracticable". Whatever their daily round has been, unless there is mist or early spring, they return to their locality after sun-up, again to seek refuge and rest in the thickets. Cloudy and misty days, of "winter and rough weather" are no enemy to them and they may be seen almost any time of day on such occasions. Salt and other items of diet might well be responsible for such wide diurnal movements, often from ten thousand or less to sixteen thousand feet or more.

Migrations: There is no evidence of a statistical nature, but shikaris report that areas recently opened up by motorable roads and hunted by poachers, soon become devoid of musk deer; they say that those musk deer which escape hunting, move away to other more inaccessible valleys for security. This might just as likely be for better chances of mating, for seeking partners must be a major pre-occupation of this animal, as it is for the most part solitary, getting together only for the breeding season.

Feeding Behaviour and Diet:

No visual evidence has been recorded in literature. Village-shikaris report that musk deer eat 'kedar-patta', (Shooting in the Himalayas: Markham, and Wilson's Notes, 1854 and 1862), a race of laurel bush. We have never seen this leaf in the stomach-contents which we examined each time a musk deer was shot. This laurel leaf is very fragrant, but then, so are scores of the herbs, shrubs, grasses, etc. (mentioned in the Appendix, op. cit.). The throats and stomachs examined by us always contained partly digested and pasty matter, partly due to the fact that only the tenderest of buds are probably ingested. Other interesting items of diet identified in the throat and mouth, include the white moss that hangs in shreds and streamers from high forest trees, wild rhubarb, wild celery and lichens. The rest of the mess was not identifiable, though a quantity of grit was once found in Kumaon inside the stomach; possibly the remnants of salt-rocks licked. They certainly eat flowers, as we have found yellow and white traces of petals in the throat. Roots are also eaten, and I have seen one animal scratching tiny holes which I took to be the work of snow-cock, till the animal

bounded away. They are also said by villagers to kill and eat snakes, a no-doubt-fanciful invention.

Defecation:

One of the more interesting habits of the musk deer is its penchant for leaving its pellet-shaped dung at certain marked spots, generally level, which through the years accumulate a sizeable store of this. This habit is shared by goral, too. The droppings of buck musk deer have the characteristic musky odour, far more pleasant than the pod itself. This is the signature of the animal, and often leads to its destruction. Dogs and poachers, often together, track the bucks by this smell. I found it amusing at first to go around smelling the pellets, glistening and freshly dropped on a droppings-tance in the forest, to discover whether the animal responsible was a buck or a doe, but gradually experience proved its worth, and never did this signature 'lie'. Villagers invariably head for such favourite stances to pick up 'news' of their movements, especially when hunting with dogs.

Breeding Behaviour:

Though little is known of the period of gestation of musk deer, the young seem to be dropped mostly in June, July and August. If gestation is nearly 4 months, as might be supposed from the quick growth and early maturity of female fawns, then breeding itself would begin in early spring, in March or so. This tallies with the observation that bucks are solitary except in spring and early summer. Only once did we see two grown musk deer together, and presumed them to be a pair. This was in May, and they were sporting around very playfully, possibly indulging in a form of courtship display. They crossed the ridge so we could not watch them longer. Once the female is about to give birth, the buck again deserts her, and she seeks a suitable locality, and then sticks to it till the fawns are mature enough to move and feed independently.

January appears to be the earliest record of pairing, and February and March the peaks. More information is needed on this aspect, as on all aspects of the ecology of the musk-deer.

Reproduction and Sexual Behaviour:

Only once did we see more than one fawn with a female; this was in August in the Chor Ramba valley in Kumaon north of Panch Chuli. We were descending from the peak, and surprised them very high up in patchy snow, where the young were feeding somewhat lower than the mother. I prevented my companion from shooting them that day, and was able to observe them for two hours, till they saw us clearly and bounded down the fantastic slopes, leaping through the air in massive jumps, only to stop a few hundred yards away to regard us curiously for a few minutes. Otherwise, only one fawn seems to be born, or at any rate, seen to survive. This is markedly different from the unique member of the *Hydropotes* Family,

the Chinese Water-Deer, which gives birth to four to six fawns at one time. The does reach mating-maturity in around one year, one explanation for relative abundance.

The pair-bond of musk deer is very strong while it lasts; once, KS, my shikari who was an inveterate poacher and trafficked in musk-pods, saw the buck scraping and licking wet rock cliffs, with lichens growing on them, at 14,000 feet in October in Pilti Gad, near Raj Ramba, in Kumaon. He was for shooting straight-away, but I was able to persuade him to let us watch for almost ten minutes. KS shot this buck, and we then saw the female appear from behind a rock-wall, uttering hisses and shrill whistles, before bounding down the ravine with remarkable agility. She stopped a hundred yards away, and kept on hissing till I finally threw a rock at her. I wish I had had a camera then!

Social Behaviour:

Inter-specific Inter-actions: Generally speaking, musk deer avoid the company of all other creatures. They are shy, not only of predators, like humans, dogs and snow leopards, but even of other herbivores. However, I have seen musk deer within sight of bharal several times, always in the monsoons, when the sky was overcast. They often bound up from their 'forms' and hollows in the forest when disturbed, and may be seen browsing within sight of domestic goats and sheep, but immediately disappear when discovered.

Intra-specific: Shy of even their own kind, they seem to be the least gregarious of Himalayan animals; even the snow leopard has an abiding pair-bond, when compared with the seasonal pairing of solitary musk. In early spring, before pairing takes place, battles are fought between rival bucks, more, possibly, for territory, than for females, who seem to seek out the bucks whenever ready for mating, by the strong smell of the musk exuded by the gland of the males. These territorial battles might well carry with the triumph the privileges of mating with the available females (as in the Uganda Kob; see *The Territorial Imperative*; Robert Ardrey). The weapons used are the sharp, curved, quill-like tusks. The only evidence with me of such battles is several skins shown me by villagers, bearing the lacerations and naked lines explained by such conduct. Villagers and shikaris who have actually seen such battles swear by the truth of this.

Dominance: Leadership would seem to play no role in their life, but musk deer are not matriarchal in their social organisation; rather, they are buck-led, and the females seek out the bucks; the phenomenon of battles before pairing mentioned above is evidence of attempts at dominance, establishment of hierarchies, as with territory. More information is needed before valid conclusions can be drawn.

Play: Playfulness seems to form part of their make-up. I have seen such behaviour often. They will cavort, jump, and often chase each other over steep terrain, with great absorption and nonchalance, and I was able to approach them very close while they were thus

engaged. Particularly the young seem to be gay and playful, and spend hours and hours jumping off rocks. Once, I saw a single fawn climb up and jump off a boulder set amidst birch forest, with patches of grass, over a dozen times, twisting and turning and capering like a fleecy lamb, while its mother, browsing, observed indifferently.

Mortality and Predation:

Nothing is known of the longevity of musk deer. From the history of three kept as pets by village-shikaris of my acquaintance, they seem to grow very rapidly, the female fawn reaching the age of maturity, and the capacity to reproduce and mate, just after one year. This may be one explanation for the remarkable abundance of musk in undisturbed areas, where mortality through predation by snow leopard must be substantial.

Predation: Hunting Pressure: Human beings are the worst enemy of musk deer, because the musk pod fetches a price comparable with gold, these days Rs. 150/- per tola. Villagers of the high Himalayas eke out their bare produce from one-crop fields by selling skins, precious stones from Himalayan glaciers, and the precious musk-pod. They hunt the musk in summer and winter, and they hunt the musk in spring and in autumn. Shikaris like those who have taught me so much about the Himalayas each claim dozens of musk in their lifetimes. Dogs are trained to this kind of specialised hunting. Trapping by various ingenious devices, fencing and snares is the most destructive form of poaching, as many musk deer are eaten up by the lesser cats and vultures before being found. Kedar Singh and Kesar Singh both come to mind, both of whom confessed to having shot over a hundred musk deer each, though they could neither of them count beyond twenty, except in 'kuris' or 'scores'. Such poaching by shikaris will increase before it can be curbed, in spite of all the well-meaning if ineffective efforts of administrations. This is because vast areas of the Himalayas so far untapped are being opened up by roads, and because people from the plains can never compete with the shikari on his own terrain, in such rigorous conditions. That is why I have so far been indulgent towards such poachers, who daily risk life and limb in pursuit of the harmless animal. But the situation now warrants powerful action; and education, ban on exports of musk, control over fire-arms in the mountains, and many other measures, are necessary to save musk deer from eventual extinction.

Natural Predation:

Snow Leopard: Doubtless the second-greatest enemy of musk deer is the snow leopard, to whose wily and swift attacks they easily fall prey. Not armed with either an acute sense of sight or of hearing, the musk rely, as is so far known, on their sharp differentiation of smells, and the snow leopard is no tyro to the game. He hunts up-wind, and the harvest is the hair and patches of skin of musk deer found all over the lairs of snow leopard (CHEETAL, Vol. 10, No. I: The Snow Leopard and Its Prey, by Hari Dang).

The Musk-pod:

The scientists of an American university have analysed musk, and muskone has even been synthesized, but the demand for the genuine article remains impressive and increases. It is used in perfumeries, in indigenous systems of medicine. It is a pungently aromatic, unpleasant substance when freshly skinned, reddish-brown in colour, and of varying consistency. In winter and autumn, it is dry, like pellets, and powdery. In summer and the monsoons, it becomes pasty and flaccid.

The gland is located between the skin and the flesh of the stomach, near the navel, and is between an inch to 2 inches of skin and membrane, enclosing the pod. There is an orifice leading out from the skin, which can be controlled muscularly, and it is through this that the musk must be expelled whenever the animal wishes to scent-mark a trail for the female. Even young fawns have the musk-pod, which is full of a white filthy-smelling substance, which 2 years later becomes musk. The pod of a healthy, grown animal would weight nearly one ounce, though much depends on season, location, etc. Females have no such gland, nor do they smell of musk. The buck does not smell of musk except at the pod, and its meat, though tangy, is free of muskiness. Its droppings reek strongly of musk, though. Thus, the process of musk-formation remains a mystery.

Even snow leopard and other predators and scavengers do not eat the musk-pod; maggots which might consume dead carcasses of musk deer, leave the musk-pod uneaten and undamaged.

Though the pod should be removed from the skin and allowed to dry, the villagers generally dry it in front of a fire, to make it compact and easy to carry or to hide!

The counterfeiting of musk-pod is an art. Many methods are adopted, but the commonest is to skin several patches off the stomach when a musk deer is killed. These are then made up into little bags resembling pods, filled with any one of several likely-looking substances, like dried blood, dried liver or gall, powdered tree-bark, even hookah-tobacco, and passed off as the genuine article with but minor addition of the genuine musk to give it the smell and the verisimilitude.

The Farming of Musk Deer:

Though it is necessary to start at this stage the breeding of stocks of all the rarer Himalayan species, to provide greater opportunity of close observation and research, the time is not ripe for the idea of a musk-farm. So little is known about the diet and plant-intake of the musk deer that, deprived of its Himalayan high-elevation diet, enclosure-animals might fail to develop musk enough for the pod. From what is known of the three musk deer in captivity which I have seen over a length of time, they do not flourish, and hardly survive more than a year, in captivity. They are said to die of 'blindness', but I

gathered from my village-shikari-musk-breeders that the musk deer had gone off food, and died of under-nutrition or starvation. A beginning could be made with a high-elevation enclosure at a suitable location, an idea the author has mooted for ten years now!

Conclusion:

Much more needs to be known about this diminutive and mysterious animal. Even our present study is merely a digest of available information, supplemented with our own observations, made mostly in the midst of mountaineering projects and hunting expeditions. What is needed, apart from a ban on the export of musk, and control on the issue of guns in the mountains, is an intensive study of all Himalayan wildlife, including musk deer. If we could discover the plant-foods responsible for the formation of the musk inside the gall-bladder of *Moschus*-physiology, we would be much nearer a possibility of farming musk-deer for the pod.

Select Bibliography and References:

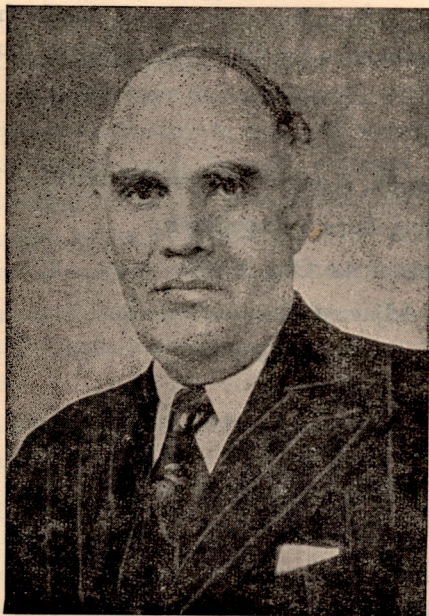
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In addition, the files of BNHS Journal, and of Cheetal were freely consulted.

Obituaries

MANOHAR DAS CHATURVEDI (1897-1968)

The world of foresters and wild life enthusiasts in India and abroad were shocked by the sad and sudden demise of Shri M.D. Chaturvedi, I.F.S. (Retd.) on the 6th of October, 1968 at Jullundhar Military Hospital. With feelings of sorrow and grief they mourned his loss and condoled with the bereaved family, paying many tender tributes to his memory.



Born at Moradabad he graduated from the University of Allahabad and entered the Indian Forest Service in 1920, to be sent to Oxford for training in Forestry where he distinguished himself. Posted to the United Provinces he rose up the ladder by sheer dint of merit to become the Chief Conservator of Forests, Uttar Pradesh and the Inspector General of Forests, Government of India. He organised the World Forestry Congress at Dehra Dun as Secretary General. He was later appointed Chief of F.A.O. in Congo.

With noble qualities of head and heart, he was respected by his subordinates, admired by his colleagues and appreciated by his superiors and became the "Guru Ji" of his fellow workers. His was a colourful personality. Shri G.B. Pant, first Chief Minister of the first popular government of U.P. chose him to be the Rural Development Officer of U.P. in which capacity he did some very useful work for the neglected villages of U.P.

He touched nothing that he did not adore. He was an orator par excellence, holding his audience spell bound; a conversationalist in great demand wherever sportsmen met; holding his own in argument against mighty odds. He was intensely practical and his strength lay in the mastery of detail.

Wild life enthusiasts will ever be grateful to him, not only for drawing the attention of the Government of India to the fast vanishing wild life heritage and for being the moving spirit behind the formation of the Indian Board for Wild Life but also for picking up, encouraging and guiding potential wild life workers who still continue to work. He was a beacon light to conservationists.

As a young forest officer he was interested in what is now the 'Shiwalik Forest Division' but which had been the happy hunting ground of Moghul Emperors and the Preserve of British Governors-General for 'Shikar'. The first Indian Governor-General of India C. Rajagopalachari was persuaded by him to convert it into a sanctuary—an 'ABHAYA ARANYA'.

He settled down in Dehra Dun and was appointed Professor Emeritus at the Forest Research Institute and Colleges and revived his interest in the Wild Life Preservation Society of India of which he was a founder member. He took to writing on wild life for the Society and his first book in Hindi—'Singh Parivar'—has been published by the National Book Trust of the Government of India and his second one in English 'Panther on the Prowl' is under print. The entire royalty on the above books goes to the Wild Life Preservation Society of India. His third and last on wild life is still in manuscript. He donated his collection of 'Shikar' books to the Society Library and presented a large panther skin to form the nucleus of a collection of trophies for the Wild Life Preservation Society of India.

The endowment which he created for the award of 'Chaturvedi Prize' for the best article on wild life published in the Indian Forester has, on his suggestion, been opened to all articles published in the 'Cheetal', the journal of the Wild Life Preservation Society of India.

He was not only a 'Shikari' but also a naturalist and a wild life photographer.

For all his work for preservation of wild life in India he shall ever be remembered with feelings of tenderness and gratitude.

R.N.M.

E.P. GEE

Edward Pritchard Gee died at the age of 64, on the 22nd of October, 1968. He was spry and fit when we last met him in August, having recovered fully from an operation of the prostrate gland last year. He was found to be suffering from a brain tumour, was flown to England and died.

One of the earlier pioneers of the conservation movement in India, he was guided into very good work in the Cause by the late M.D. Chaturvedi, and was an active member of the Indian Board of Wild Life and served on its Executive. He was also a member of numerous conservation organisations, like our own and the BNHS, and served on the Survival Service Commission and other committees of the IUCN.

A tea planter in Assam till the late fifties, I first met him at the Golaghat Club near Jorhat. It was 'EP' who guided me like the late Chaturvedi had guided him, into conservationist channels, and our companionable visits to the Kaziranga Sanctuary stand out in mind as some of the happiest of my Assam holidays. He was full of the lore of wildlife which he later utilised in his book on *The Wild Life of India*.

I felt disheartened in my own tea planting days, and it was he who kept me there by his sage remark : "Life is Army; you have to stick in and make good". Of course he knew about the army, having served with credit on the Burma front; even if knowledge of life as an Indian on Scots-controlled tea gardens was not his forte, he more than made up for it by his own exemplary conduct.

The General Assembly of the IUCN due to be held in New Delhi in November, 1969 was largely his initiative, and he will be sorely missed, at this as at all other wild life conservation gatherings. Incessantly speaking or writing articles, he was often affectionately termed 'chatter-Gee' by friends, and for his other serious discovery, the actual photographing and description of the Golden Langur, *Presbytis geei*, he was made Corresponding Member of the Royal Zoological Society, in consequence of which his planter-friends called him E.P. Langur-Gee !

He was to join me and Dr. George Schaller and Sri R.K. Dang for a preliminary ecological survey of the high elevation Laya Sanctuary in Bhutan as part

of the activities of the Himalayan Wild Life Research Project, this October, but his death, and the floods, put an end to it this autumn.

His book *The Wild Life of India*, is a classic of its kind, and remains the best so far produced. In it he condensed the findings of a lifetime spent in the forests and the sanctuaries of India. Particularly interested in and expert at the rhinoceros of Kaziranga, he was an honorary forest officer of Assam.

His death will be a great loss to the wildlife effort in India, and his amusing and active personality will be missed by all his friends and many admirers.

H.K.D.

Dr. DURGA PRASAD

On the 9th of July, 1968 died Dr. Durga Prasad leaving behind the citizens of Dehra Dun mourning the loss of a popular doctor of the rich and the poor. He was an active member of the Wild Life Preservation Society of India and Past Governor of the Rotary of which he was a founder Member. "D.P."—as he was affectionately called—and the Rotary in Dehra Dun were inseparable. He was an embodiment of the spirit of the Rotary. He was the first person from Garhwal to qualify as a doctor from Lucknow and started practising medicine in Dehra Dun in the twenties and by his personal qualities he endeared himself to one and all. He was a renowned physician, Grand Master of the Lodge of India, President of the All India Medical Association, a city father and above all one who served humanity with devotion. The student community from Garhwal in Dehra Dun will ever remember him with feelings of admiration and gratitude.

R.N.M.

RUPA—The Lioness

It is with regret that we mourn the passing away of 'Rupa' lioness today. 'Mohan', the lion, when playing with her, accidentally pushed her towards the moat. Rupa fell in the moat. She struggled in vain. We tried to rescue her by throwing a rope, but this was too late.

Rupa was born in Udaipur Zoo on the 27th August, 1956. She was presented to the Delhi Zoo on the 10th August, 1957. For eleven years she was the reigning queen of the lion enclosure. During this period she littered seven times and gave birth to 19 cubs.

For the last two years she was suffering from a mild paralytic condition of hind-quarters. Her gait became staggering and she stumbled while negotiating her evening walks. She was the lonely lioness who walked the ridge of the enclosure many evenings.

Rupa leaves behind her two cubs, many admirers, members of the staff and visitors.

D.Z.P.

WORLD WILD LIFE FUND, Morges (Switzerland)

This is the Symbol of the World Wild Life Fund



A Giant Panda (Ailurpoda melanoleuca) has been chosen to symbolise the work of the Fund because it is one of the best-known and best-loved rare animals in the world, and because it owes its survival to the sort of careful conservation which all wild creatures deserve.

Wild Life Preservation Society of India

HONORARY SECRETARY'S REPORT, 1967-68.

The Society having completed ten years of its useful existence, enters the 11th year with confidence and hope; growing from strength to strength not only through increase in membership but from the fact that more and more members are taking active interest in the conservation movement which is gaining momentum. The Society functions as a catalytic in wild life conservation programmes of various States; as adviser on matters of wild life research, helping individuals, organisations and governments within the country and outside. It receives encouragement, co-operation and help from all for which it is grateful. Its members occupy position of prestige and honour in conservation circles in the world—Dr. Harold J. Coolidge—a life member—is President of I.U.C.N., Mr. Futehally and Dr. Nagendra Singh are on the various Commissions of I.U.C.N., and many others are on the Indian Wild Life Board and State Wild Life Boards.

Mr. M. Krishnan, one of our members has been awarded a Fellowship by Nehru Memorial Trust for an ecological survey of mammals of peninsular India. This is considered a national honour.

Membership

During the year, 2 Patrons, 10 Life Members, 12 Ordinary Members, 8 Professional Members, 6 Educational Members, 1 Honorary Member and 67 Student Members joined the Society.

Cheetal

“CHEETAL” the half-yearly journal of the Society is becoming more and more useful and its circulation increases every year. It is not as yet self-supporting financially.

According to the wishes of late Shri M.D. Chaturvedi, all articles on wild life published in the ‘CHEETAL’ and the INDIAN FORESTER will be eligible for consideration for award of ‘Chaturvedi Prize’ for the best article on wild life published during a year.

Library

The Library and the Reading Room are being increasingly utilised. Some rare and many latest books have been added to the Library. Nearly all important wild life journals are received for the Library.

Research Programme

Research Programme is going on inspite of financial difficulties and progress is reported on all projects registered with the Society.

Revenue Account

The Auditors' Report, the Balance Sheet and the Income and Expenditure account now before you show a deficit of Rs. 873.05 which is not much. The assets of the Society have increased from Rs. 26,475.70 to Rs. 31,251.48 during the year.

Publications

Late Shri M.D. Chaturvedi, I.F.S. (Retd.) wrote two books for the Society—‘Singh Parivar’ in Hindi and ‘Panther on the Prowl’ in English. ‘Singh Parivar’ has been published and ‘Panther on the Prowl’ accepted for publication by the National Book Trust, India. The Society will get all the royalties on the above two books. The Society owes a debt of gratitude to late Shri M.D. Chaturvedi and wishes others to follow his noble example by writing books for the Society.

Estimate of Income and Expenditure for 1968-69.

INCOME		EXPENDITURE	
	Amount		Amount
1. Subscriptions:		1. Salaries to Staff	1,800.00
(i) Patrons	750.00	2. Conveyance Allowance	600.00
(ii) Life Members	1,650.00	3. Postage	250.00
(iii) Ordinary Members	2,000.00	4. Printing and Stationery	400.00
(iv) Professional Members	200.00	5. Rent and Taxes	900.00
(v) Educational Members	200.00	6. Electricity, Water & Conservance	150.00
(vi) Student Members	1,200.00	7. Entertainment Bills	500.00
(vii) Institutional Members	240.00	8. Contribution to Bihar Br.	50.00
(viii) Affiliated Members	240.00	9. Expenditure by the Delhi Rep.	100.00
(ix) Admission Fees	800.00	10. I.U.C.N. Subscription	400.00
2. Cheetal Publication:		11. B.N.H.S. Subscription	40.00
(i) By subscriptions	1,800.00	12. Bank Charges	100.00
(ii) Postage	50.00	13. Audit and Accounting Fee	150.00
(iii) Advertisements	1,700.00	14. Books for the Library	250.00
(iv) Grant from Govt.	1,000.00	15. Cheetal Publication:	
3. Sale of Society's Articles:		(i) Printing Charges	4,200.00
(i) Pads and Covers	150.00	(ii) Postage	500.00
(ii) Greeting Cards	1,125.00	(iii) Miscellaneous	10.00
(iii) Ties	250.00	16. Society's Articles:	
(iv) Balance of Nature Game	30.00	(i) Greeting Cards	750.00
(v) Blazer Buttons	50.00	(ii) Lapel Badges (due to H.H.)	800.00
(vi) Lapel Badges	100.00	17. Himalayan Wild Life Project	60.00
(vii) Tourist Guide	5.00	(Camera Stand)	
4. Interest on Fixed Deposits:	795.00	18. Miscellaneous:	
5. Miscellaneous:		(i) Renewal of Tel. Address	50.00
(i) Donations	100.00	(ii) Typewriter repairs	25.00
(ii) Bank Charges	25.00	(iii) Misc. Contingencies	105.00
(iii) Postage	50.00	19. To Reserve Fund	3,200.00
Total	14,510.00	Total	15,390.00
Deficit	880.00		
Total	15,390.00		

AUDITOR'S REPORT

The President & Members, Executive Committee,
Wild Life Preservation Society of India, Dehra Dun.

Gentlemen,

We have audited the accounts of the Society for the year ending 31st March, 1968, from the books and vouchers maintained and the information and explanations given to us. The following statements are annexed hereto :—

- (i) Balance Sheet as at 31st March, 1968.
- (ii) Income & Expenditure Account for the year ending 31st March, 1968.
- (iii) Annexure A of Outstandings Payable, Outstandings Recoverable and Closing Stock, and
- (iv) Annexure B of 'CHEETAL' Publication Account.

As mentioned at the foot of the Balance Sheet, our separate report is as under:—

1. Working :

The working of the year shows a deficit of Rs. 873-05 (after adjusting loss of Rs. 789.67 from 'CHEETAL' Publication) against a deficit of Rs. 3,253.02 (after adjusting loss of Rs. 830.50 from 'CHEETAL' Publication) of the previous year. There is thus a net decrease in deficit of about Rs. 2,500.00 which is chiefly due to following:—

Increase In Income :		Rs.	Rs.	Rs.
Subscription Demand from Student Members	about	200	—	—
Income from Pads & Covers	,,	200	400	—
Decrease In Expenses :		—		
Rent & Taxes :	,,	200	—	—
Amounts Written Off	,,	2,300	2,500	2,900

Less : Increase In Expenses :

Subscription to IUCN	,,		400
Net Decrease In Deficit of about		Rs.	2,500

The fall in deficit is mainly due to reduction in the amounts written off about Rs. 2,300 as only small sum has been written off during the year although we feel large amounts are doubtful of recovery, as noted below:—

Ordinary Members	Rs.	843.00	
Professional Members	Rs.	126.00	
Educational Members	Rs.	42.00	
Affiliated Members	Rs.	300.00	
Institutional Members	Rs.	120.00	
Subscribers to 'CHEETAL'	Rs.	1,144.30	Rs. 2,575.30

If the above doubtful balances are not recovered, the Society's deficit will increase by the amount not recovered and ultimately written off.

2. Recoveries :

Collections of Subscriptions from members are falling. The recoveries must be improved to avoid financial difficulties in future years. Recoveries from Ordinary Members were only Rs. 804.00 against demand for the year and previous year outstanding of Rs. 3,910.00.

3. Regional Branches :

Assam Branch :

It is explained to us that inspite of repeated requests, no accounts have been received from the branch for subscriptions received by them from Assam Branch members and expenses incurred against their commission of 10% of subscriptions.

Bihar Branch :

This Branch is not sending its accounts of expenditure. Therefore Rs. 30.60 due to Branch on account of 10% contribution of subscriptions received from Bihar Branch members has not been charged to expenditure and credited to Bihar Branch Accounts. This should be adjusted in the current year as at present Rs. 19/- are outstanding against the Branch.

The accounts are well maintained.

We thank the Honorary Secretary and the Accountant for the co-operation given to us during the course of audit.

We remain,

Yours faithfully,

For M/s. P.N. BAHRI & CO.,
Chartered Accountants.

Sd. P.N. Bahri, Partner,
Chartered Accountant.

DEHRA DUN.
August 12, 1968.

AUDITED STATEMENT
OF
BALANCE SHEET
&
INCOME & EXPENDITURE ACCOUNT
1967-1968

THE WILD LIFE PRESERVATION SOCIETY

Balance Sheet as

Prev Year	LIABILITIES	Rs.	Rs.
	Outstandings Payable :		
1404	As per Annexure A		1,486.84
	Donation from H.H. Nabha for Patron Members :		
	Advance Deposit		
	Last Balance	2,288.94	
2289	Less : Transfer to Society Fund for Patron Members introduced by H.H. Nabha	<u>500.00</u>	1,788.94
1080	Corbett Prize Fund		
	Last Balance		1,080.00
	Himalayan Wild Life Research Project		
2000	(Sri Dorab Jee Tata Trust) Last Balance		2,000.00
	Suspense Account		
6	Subscription from Subscriber not known		6.00
	Loan		
788	From H.H. Maharaja Nabha for Lepal Badges		787.50
	Society Fund		
	As per last Balance Sheet	18,909.36	
	Add : Donations from Fauna Preservation Society,		
	London : £ 85/-	1,522.39	
	Life Members	1,420.00	
	Patrons (including Rs. 500.00 by adjustment) :	1,000.00	
	Admission Fees	360.00	
	Donations of Library Books	119.50	
	Donations from H.H. Nabha		
	Ties : 1,512.00		
	Buttons : 132.00	1,644.00	
		<u>6,065.89</u>	
		24,975.25	
18909	Less : Deficit as per Income & Expenditure Account	<u>873.05</u>	<u>24,102.20</u>
26476			Rs. 31,251.48

OF INDIA, DEHRA DUN.

on 31st March, 1968.

Prev. Year	ASSETS	Rs.	Rs.
	Office Furniture & Equipments		
976	As per last Balance Sheet	976.00	
	Less : Depreciation @ 10%	<u>98.00</u>	878.00
	Library Books		
1140	As per last Balance Sheet	1,140.00	
	Additions during the year	246.50	
	Donations in kind	<u>119.50</u>	
		1,506.00	
	Less : Depreciation @ 20%	<u>228.00</u>	1,278.00
	Cost of Camera Purchased from Donations for Himalayan Wild Life Research Project		
1765	As per last Balance Sheet		1,764.95
492	Cost of 13 Photos (Donations)		<u>491.65</u>
	Capital Assets		4,412.60
	Advance Contribution to Bihar Regional Branch (Adjustable on receipt of statement of accounts)		
19			19.00
	Outstanding Recoverable		
5151	As per Annexure 'A'		6,372.85
	Security Deposits		
	Electric	40.00	
60	Water	<u>20.00</u>	60.00
	Stok in Hand		
3863	As per Annexure 'A'		3,614.85
	Cash & Bank Balances		
10762	Fixed Deposit with Central Bank of India Ltd. Dehra Dun	13,910.91	
2248	With Central Bank of India Ltd., Dehra Dun in Current Account	2,794.26	
	Petty Cash In Hand	0.10	
	Postage Stamps in Hand	<u>66.91</u>	16,772.18
26476			Total Rs: 31,251.48

As per our separate report of even date attached.
For M/s. P.N. BAHRI & Co., Chartered Accountant,
P. N. Bahri,
Chartered Accountant,
Partner.

THE WILD LIFE PRESERVATION SOCIETY

Income & Expenditure Account

Prev. Year	EXPENDITURE	Rs.	Rs.
	To Office Expenses		
1531	Salaries to Staff upto February '68	1,772.46	
1072	Rent & Taxes	843.50	
118	Electric, Water & Conservancy	134.94	
600	Honorary Secretary's Conveyance Allowance (1-3-67 to 29-2-68)	600.00	
205	Postage & Telegrams	155.10	
378	Printing & Stationery	240.27	
56	Books & Periodicals	2.40	
92	Bank Charges	99.08	
150	Audit Fee and Accountancy Charges	150.00	3,997.75
	Entertainment :		
306	General Meeting	306.00	
66	Others	73.15	379.15
38	General Meeting Photos :		35.00
	Subscriptions :		
	To Bombay Natural History Society	36.00	
	To International Union for Conservation of Nature 50	384.16	420.16
	Miscellaneous Expenses :		
50	Telegraphic Address Renewal	50.00	
18	Repairs to Typewriter	6.00	
39	Other Expenses	47.30	103.30
	Cheetal Publication :		
831	Loss as per Annexure 'B'		789.67
	Free Issues :		
	Greeting Cards	5.20	
	Ties—'Cheetal'	12.00	
	Buttons—Blazer	12.00	
	Lapel Badges	6.00	
	Balance of Nature Games	24.00	59.20
	Amounts Written Off :		
1650	Ordinary Members (Deceased)	48.00	
174	Professional Members	—	
240	Institutional Members	—	
240	Affiliated Members	—	
—	Advertisements	80.00	128.00
	Depreciation		
108	On Furniture	98.00	
246	On Library Books	228.00	326.00
8237			Total Rs. 6,238.23

OF INDIA, DEHRA DUN.
for the year ending 31st March, 1968.

Prev. Year.	INCOME		Rs.	Rs.
By Subscription Demand :				
1884	Ordinary Members		1,836.00	
234	Professional Members		264.00	
918	Student Members		1,152.00	
222	Educational Members		268.00	
25	Family Members		25.00	
180	Institutional Members		180.00	
240	Affiliated Members		240.00	3,965.00
,, Other Income :				
—	Pads & Covers		140.36	
392	Greeting Cards		439.47	
—	Ties—'Cheetal		36.00	
4	Buttons—Blazer		16.75	
8	Balance of Nature Games		—	
140	Lapel Badges		19.00	
—	Tourist Guide		1.75	
544			653.33	
Less : Loss on				
5	Balance of Nature Games		1.80	
437	107	102	Pads & Covers	
			651.53	
By Miscellaneous Income :				
14	Bank Charges		16.65	
68	Postage & Packing		54.63	
—	Photo—General Meeting		3.50	726.31
610	,, Interest on Fixed Deposits			649.03
,, Unclaimed Liability Written Off				
U.P. Urban Property Tax			0.50	
151	Balance of Salary Payable to Ex-clerk		24.34	24.84
,, Deficit :				
2423	Society Account		83.38	
831	Cheetal Account		789.67	873.05
8237			Total Rs.	6,238.23

Certified in terms of our separate report of even date.
 For M/s. P.N. BAHRI & CO., Chartered Accountant
 Sd. P.N. Bahri,
 Chartered Accountant,
 Partner.

THE WILD LIFE PRESERVATION SOCIETY OF INDIA, DEHRA DUN:

Annexure 'A'

OUTSTANDINGS PAYABLE

Prev. Year.		Rs.	Rs.
	Unpaid Expenses :		
	Due to Assam Regional Branch	124.42	
	Audit Fee & Accounting Charges	150.00	
1130	Goyal Studios	127.51	401.92
	Advance Subscriptions :		
—	Admission Fees	20.00	
67	Ordinary Members	128.28	
76	Professional Members	118.00	
54	Educational Members	26.00	
—	Family Members	28.00	
12	Student Members	716.00	
65	'Cheetal' Subscribers	48.64	1,084.92
<u>1404</u>		<u>TOTAL Rs.</u>	<u>1,486.84</u>

OUTSTANDINGS RECOVERABLE

Prev. Year		Rs.	Rs.
9	Pads & Covers	16.50	
795	Greeting Cards	86.50	
—	Buttons—Blazer	1.00	
280	Lapel Badges	84.00	
—	Ties—Cheetal	12.00	
—	Balance of Nature Games	6.00	
555	Advertisements	388.50	594.50
	Subscriptions		
1220	'Cheetal'	1,701.35	
1432	Ordinary Members	2,478.00	
236	Educational Members	356.00	
222	Professional Members	354.00	
—	Family Members	25.00	
42	Student Members	84.00	
120	Institutional Members	300.00	
240	Affiliated Members	480.00	5,778.35
<u>1551</u>			<u>6,372.85</u>

STOCK IN HAND

1378	'CHEETAL' copies in hand	776.61
38	Pads & Covers	142.60
106	Greeting Cards	11.00
1070	Balance of Nature Games	1,032.30
180	Ties—Cheetal	1,428.00
18	Buttons—Blazer	22.00
273	Lapel Badges	202.34
800	Printing & Art Paper	—

3863

TOTAL Rs. 3,614.85

For M/s. P.N. BAHRI & CO.,
Chartered Accountants
Sd. P.N. Bahri, Partner,
Chartered Accountant.

15, Rajpur Road, Dehra Dun.
Dated : Augst 12, 1968.

THE WILD LIFE PRESERVATION SOCIETY OF INDIA, DEHRA DUN

Annexure 'B'

"CHEETAL" Publication Account for the year ending 31st March, 1968

Prev. Year		Rs.	Rs.	Rs.	Rs.
	EXPENDITURE				
	Opening Stock of Cheetal				
841	(1641 copies)				
—	incl. 1339 old			1,378.00	
4062	Donated Paper Consumed			800.00	
599	Printing Charges			3,066.00	
17	Postage			754.71	
—	Photographs			4.08	
—	Press Cuttings			44.40	6,047.19
<u>5519</u>					
	Less : INCOME				
	Subscriptions				
954	Receipts during the year	1,017.50			
26	Advance on 31-3-67	65.44			
1220	Outstanding on 31-3-68	<u>1,701.35</u>	2,784.29		
<u>2200</u>					
	Less :				
65	Advance on 31-3-68	48.64			
808	Outstanding				
1327	on 31-3-67	<u>1,167.15</u>	<u>1,215.79</u>	1,568.50	
—	Advertisements				
717	Receipts during the year	1,954.00			
554	Outstanding				
1271	on 31-3-68	<u>468.50</u>	2,422.50		
	Less :				
1046	Outstanding				
37	on 31-3-67		<u>554.50</u>	1,868.00	
—	Postage			44.41	
900	Grant-in-aid from				
1378	Government of India			1,000.00	
—	Closing Stock of 'Cheetal'				
—	1369 copies (including				
—	1312 old)			776.61	5,257.52
<u>4686</u>					
831	DEFICIT : (LOSS) ON 31-3-1968				<u>789.67</u>

Note : Value of free issues of Cheetal old and new, 493 copies Rs. 684.59, not adjusted.

15, Rajpur Road, Dehra Dun.
Dated : August 12, 1968.

For M/s. P.N. BAHRI & CO.,
Chartered Accountants.
Sd. P.N. Bahri, Chartered Accountant,
Partner.

APPLICATION FORM

The Wild Life Preservation Society of India

hereby apply to be admitted as a Life/Ordinary/Professional/Educational/Family/Affiliated/Institutional/Student Member of the Wild Preservation Society of India.

My interests are.....

Name.....

Designation

Address

Date of Birth.....

MEMBERSHIP

1. Life : Rs. 150.00
2. Ordinary : Rs. 20.00 Entrance Fee + Rs. 12.00 subscription per annum.
3. Professional :
(Foresters, Agricultural Workers, Soil Conservationists, Wild Life Managers) } 50% of Ordinary Members.
4. Educational :
(Teachers and Trainers) } 50% of Ordinary Members.
5. Student : 50% of Ordinary Members. No Entrance Fee.
6. Family :
(Applies to 2, 3 and 4 above) Twice Ordinary Members. No Entrance Fee.
7. Affiliated :
(Other similar bodies) }
8. Institutional :
(Messes, Units, Schools, Colleges, etc.) } Five times the Ordinary Members, i.e., Rs. 60.00 with 5 votes. No Entrance Fee.

The Wild Life Preservation Society of India

To Members,

There are many people who have the interests of Wild Life Conservation at heart but in these difficult days are not able to do as much for the cause during their lives as they otherwise might.

It is, therefore, considered that a Form of Bequest might appeal. Such a form is, therefore, now inserted in our Journal and the attention of members is respectfully invited.

Any sums received will be wisely expended in measures calculated to conserve wild life.

FORM OF BEQUEST

I give and bequeath the sum of.....unto the Wild Life Preservation Society of India, Dehra Dun and I declare that the receipt of the Honorary Secretary and Treasurer of the said Society shall be sufficient discharge for the said sum.

Signed.....

Address.....

Witness :

Name.....

Address.....

Occupation.....

Announcement

Jawaharlal Nehru Fellowship

The Wild Life Preservation Society of India has been recognised and approved as an institution of National importance by Jawaharlal Nehru Memorial Fund to route and recommend applications to the Trustees for grant of Jawaharlal Nehru Fellowships.

Jawaharlal Nehru Fellowships are not only aimed at excellence, but the sphere of activity which they cover, far from being restricted to the academic world, includes the whole spectrum of human endeavour, taking into account Nehru's multifaceted personality and his many splendoured achievements.

Fellowship are open to scholars in every discipline and also to writers, journalists, artists, and civil servants. They are open to Indian citizens with complete freedom to work at a place of their choice anywhere in India.

There is no time limit for submission of applications. The number of fellows at any given time shall not exceed 25. The duration will vary from one to two years according to the requirements of each case.

The fellows will be paid a stipend of Rs. 3000/- per month and will be provided secretarial assistance and also travelling expenses to pursue their work. Their actual expenses on the two items will be met by the Fund subject to a maximum of Rs. 10,000/ per annum for each Fellow.

There is no printed form of application but the following information may be required:—

1. Bio-data
2. Experience in the field of specialisation
3. Original work
4. Project proposed to be undertaken
5. Remarks of the forwarding institution

The Wild Life Preservation Society of India will be glad to consider for recommendation to the Fund applications from members and non-members, relating to any aspect of wild life.

Correspondence should be addressed to The Honorary Secretary, Wild Life Preservation Society of India, 7, Astley Hall, Dehra Dun.

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Our Publications

Our First Book in Hindi 'Singha Parivar' by late Shri M.D. Chaturvedi, I.F.S. (Retd.) has been published by The National Book Trust, India and is priced at Rs. 3/- only. It may be had from the Honorary Secretary, Wild Life Preservation Society of India, 7, Astley Hall, Dehra Dun.

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Our Second book "Panther on the Prowl" in English by late Shri M.D. Chaturvedi, I.F.S. (Retd.) is under publication with National Book Trust, India and will be out soon. Please book your orders in advance with the Honorary Secretary, Wild Life Preservation Society of India, 7, Astley Hall, Dehra Dun.

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